

Service Manual

Panaboard
Electronic Print Board

KX-B620

KX-B620A

KX-B620C

KX-B620G

KX-B620H

KX-B620T

KX-B620U

KX-B520

KX-B520A

KX-B520C

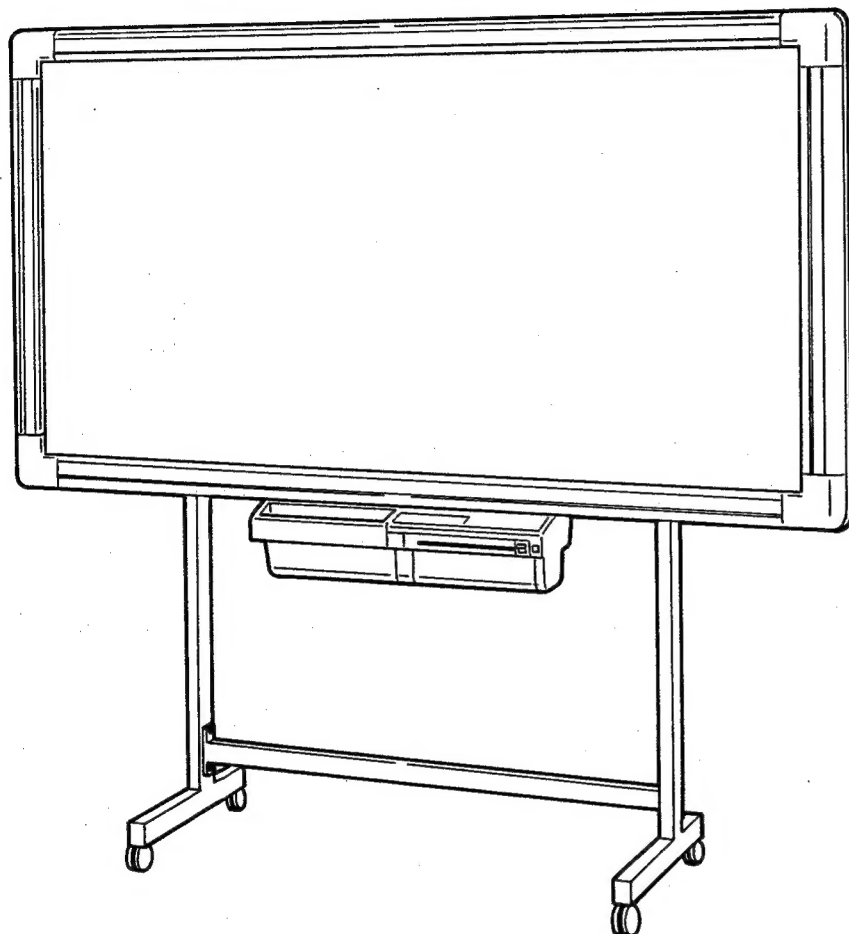
KX-B520G

KX-B520H

KX-B520S

KX-B520T

KX-B520U



(This picture is KX-B620. Stand is optional.)

Panasonic

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WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Please use this manual for KX-B620 Series (all models) and KX-B520 Series with "a" mark on the nameplate (see below):

NAMEPLATE

Panasonic
ELECTRONIC PRINT BOARD
MODEL NO. KX-B520

POWER SOURCE :

Matsushita Electric Industrial Co., Ltd.
Made in Japan

a

Panasonic
ELECTRONIC PRINT BOARD
MODEL NO. KX-B620

POWER SOURCE :

Matsushita Electric Industrial Co., Ltd.
Made in Japan

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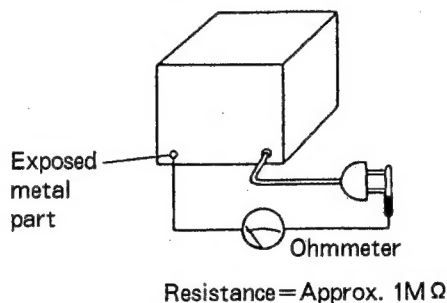
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1. SAFETY PRECAUTIONS

- 1) Before servicing, unplug the power cord to prevent an electric shock.
- 2) When replacing parts, use only manufacturer's recommended components for safety.
- 3) Check the condition of the power cord. Replace it if wear or damage is evident.
- 4) After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
- 5) Before returning the serviced equipment to the customer, make the following insulation resistance test to prevent a shock hazard.

2. INSULATION RESISTANCE TEST

- 1) Unplug the power cord and check for continuity between earth ground on the plug and the metal cabinet part.
- 2) With the unit unplugged, short the two prongs of the plug with a jumper wire.
- 3) Turn on the power switch.
- 4) Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads, etc.
Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.
- 5) If the measurement is outside the specified limits (approx. $1\text{M}\Omega$), there is a possibility of a shock hazard.



3. FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help to prevent recurring malfunctions.

- 1) Cover the plastic parts with aluminum foil.
- 2) Ground the soldering irons.
- 3) Use a conductive mat on the work-table.
- 4) Do not grasp IC or LSI pins with bare fingers.

4. SPECIFICATIONS

1. TypeWall mounted (Floor mounted)
 2. Copy SystemThermal Head, Heat Sensitive
 3. Copy PaperHeat Sensitive, Roll Paper
 4. Copy Paper Size297×210 mm (A4 size), 279.4×215.9 mm (Letter size)
 5. Copy Size270×170 mm
 6. Copy DensityApproximately 8 dots/mm
 7. Copy ColorBlack
 8. Copy TimeApproximately 18 seconds
 9. Paper FeedAutomatic Discharge
 10. Board Screen SizeKX-B620 Series: 912×1,762 mm [35.9×69.4 in]
KX-B520 Series: 912×1,400 mm [35.9×55.1 in]
 11. Copy AreaKX-B620 Series: 842×1,660 mm [33.1×65.4 in]
KX-B520 Series: 842×1,330 mm [33.1×52.4 in]
 12. No. of Screens2 Screens, Endless Roll
 13. Screen ScrollSingle Direction, Single-screen Forward
 14. Reading SystemCCD Sensor, Flat Scan
 15. External DimensionsKX-B620 Series: 1,912(W)×165(D)×1,232(H)mm [75.3×6.5×48.5 in]
KX-B520 Series: 1,550(W)×165(D)×1,232(H)mm [61.0×6.5×48.5 in]
 16. WeightKX-B620 Series: 27kg [60 lb] (without optional stand)
KX-B520 Series: 25.5kg [56.2 lb] (without optional stand)
 17. Model No.KX-B620/620A/620C/620G/620H/620T/620U
KX-B520/520A/520C/520G/520H/520S/520T/520U a
- | | | | | |
|-----------------------------|----------------------|------------------------|----------------------------|--------------------------|
| | KX-B620T
KX-B520T | KX-B620/C
KX-B520/C | KX-B620G/H
KX-B520G/H/S | KX-B620U/A
KX-B520U/A |
| 18. Power Source | AC 110V 60 Hz | AC 120V 60 Hz | AC 220-230V 50/60 Hz | AC 230-240V 50 Hz |
| 19. Power Consumption | 1.3A | 1.3A | 0.7A | 0.6A |
- (During operation at Normal Load)
20. Environmental Conditions.....Temperature 10°C to 35°C
Humidity 30 to 85%RH
 21. Accessories.....Copy Paper 1 roll
Eraser 1 pc.
Markers 1 Black
1 Red
1 Blue
 22. Assembly PartsWall-mounting Fixture 1 for Fixing
1 for Adjustment
Frame Cover B 1
Frame Cover C 1
Bracket Frame Fixture (u) 1
Screw (M3) 2 for Frame Cover C
Screw (M4 Short) 5 for Bracket Fixture
Screw (M4 Short) 2
Screw (M4 Long) 2 for attachment of Printer Section
* Screw (M6) 4 for Wall-mounting fixtures

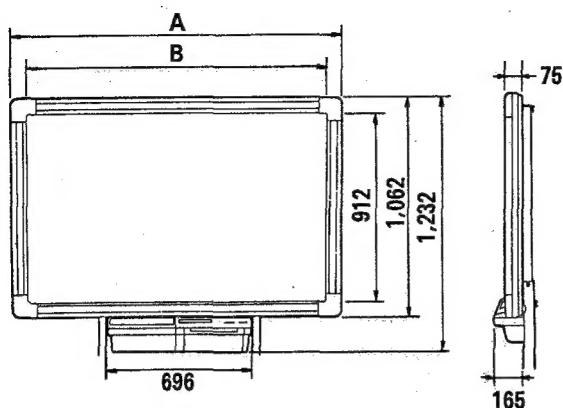
* This screws are not provided with U.S.A. model.

Features

- Any information written on the film screen can be copied on A4 or letter size paper.
- Efficiency will greatly increase during conferences, with little need to take notes.
- Charts, graphs or other materials can be copied on A4 or letter size paper.
- The copies have a binding margin, convenient for filing.

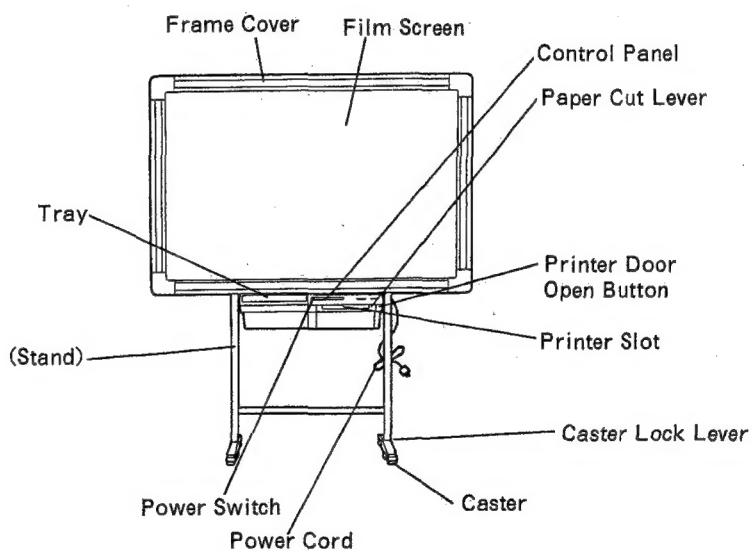
Design and Specifications are subject to change without prior notice.

5. EXTERNAL DIMENSIONS



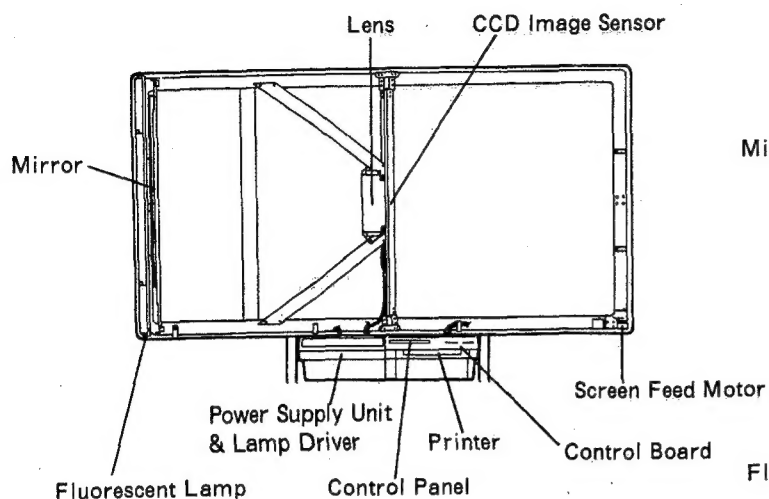
	KX-B620 Series	KX-B520 Series
Length A	1,912	1,550
Length B	1,762	1,400

6. EXTERNAL PARTS (With optional stand)

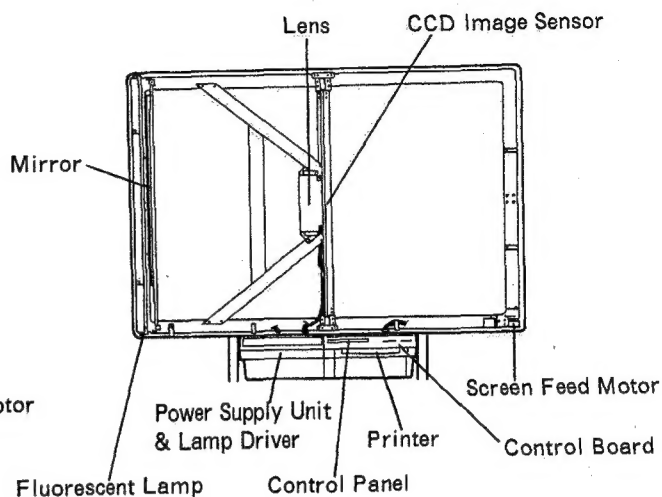


7. COMPONENT LOCATION

KX-B620 Series

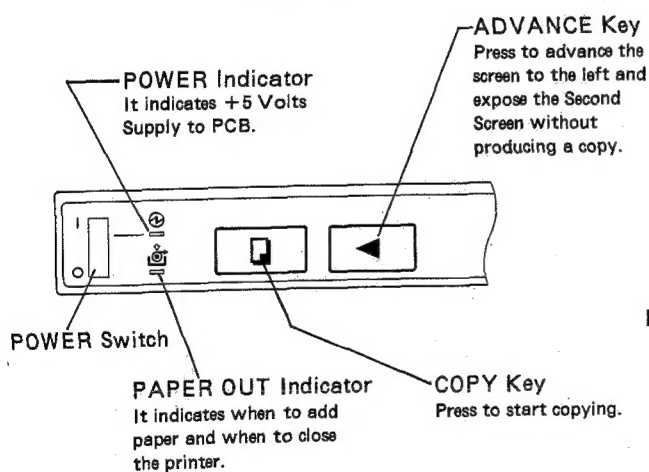


KX-B520 Series

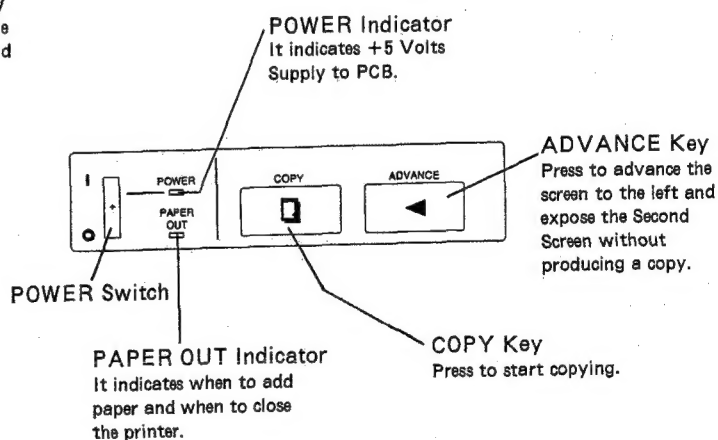


8. OPERATOR CONTROLS/INDICATORS

KX-B620 Series



KX-B520 Series



9. UNPACKING/INSTALLATION

Installation Requirements

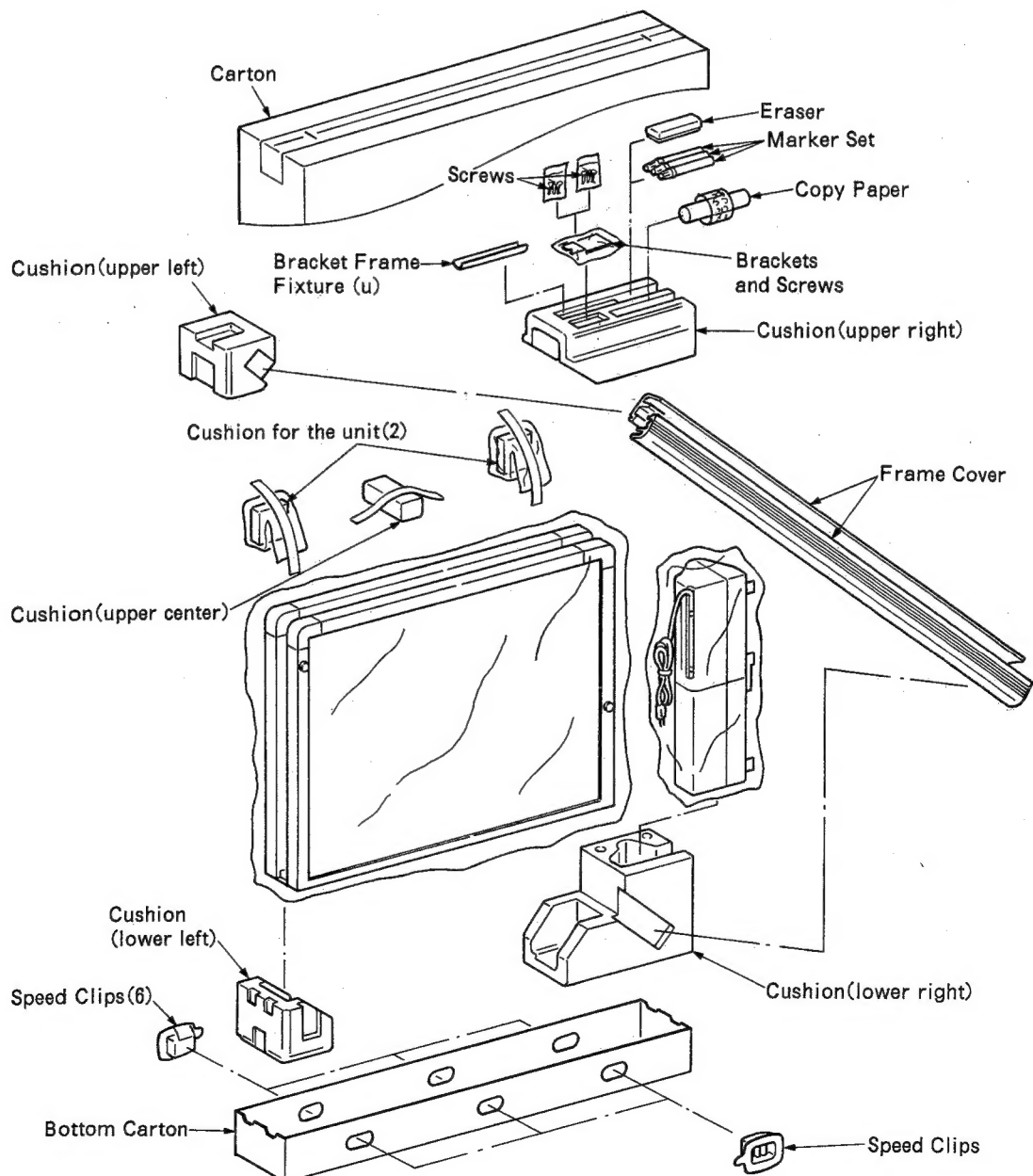
The Panaboard is a precision designed machine, which somewhat depends on the surrounding conditions for optimum operation.

Attention to the following, will result in more reliability and quality performance.

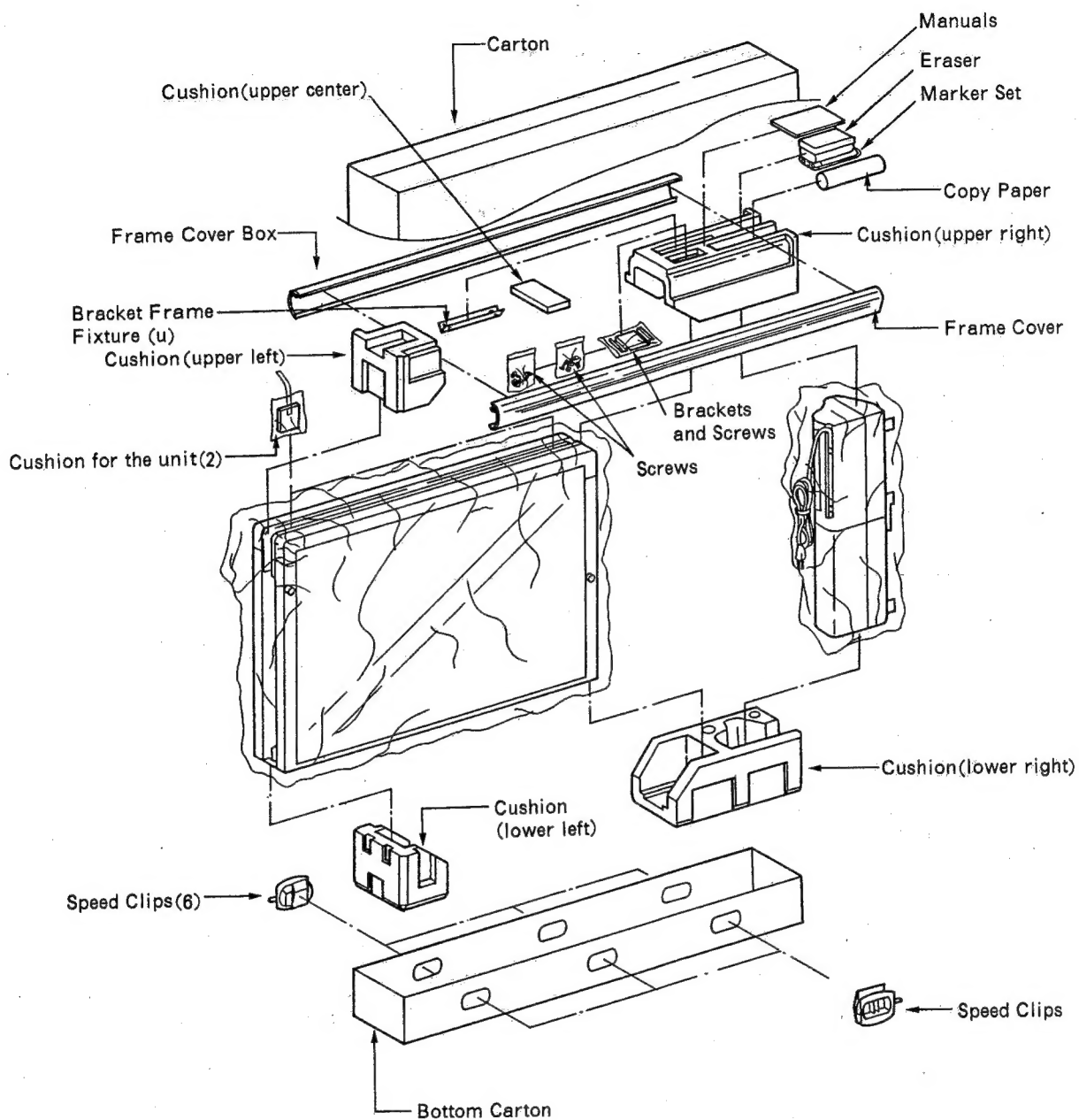
1. The Panaboard should not be installed in areas with the following conditions:
 - (1) High temperature and high humidity or low temperature and low humidity
 - (2) Direct exposure to sunlight
 - (3) Direct in air conditioning flow, or close to heater ducts
 - (4) Uneven floor
2. The Panaboard weights 35 kg (KX-B520 Series: 32 kg), it should be installed on sturdy flat surface.

UNPACKING

KX-B620 Series






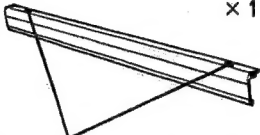


KX-B520 Series



INSTALLATION

The packing box includes the parts noted below; please confirm that all parts are present before beginning work.

● Accessories for Assembling the Electronic Print Board:

Illustration/Q'ty	Order of Use (Step)	Illustration/Q'ty	Order of Use (Step)
 × 1 [Bracket Frame Fixture(u)]	⑦	 × 2 [M4×20 mm (13/8")]	⑮
 × 7 [M4×12 mm (15/32")]	⑦ ⑮	 × 1 Mounting holes [Frame Cover C]	⑰
 × 1 [Frame Cover B]	⑬	 × 2 [M3×8 mm (5/16")]	

Installation/Assembly

Note: ① Assemble Print Board on a flat surface.

② Failure to remove the joint Bracket (with Red Tag) before opening Print Board could result in Hinge damage.

Assembling of the Print Board is as follows:

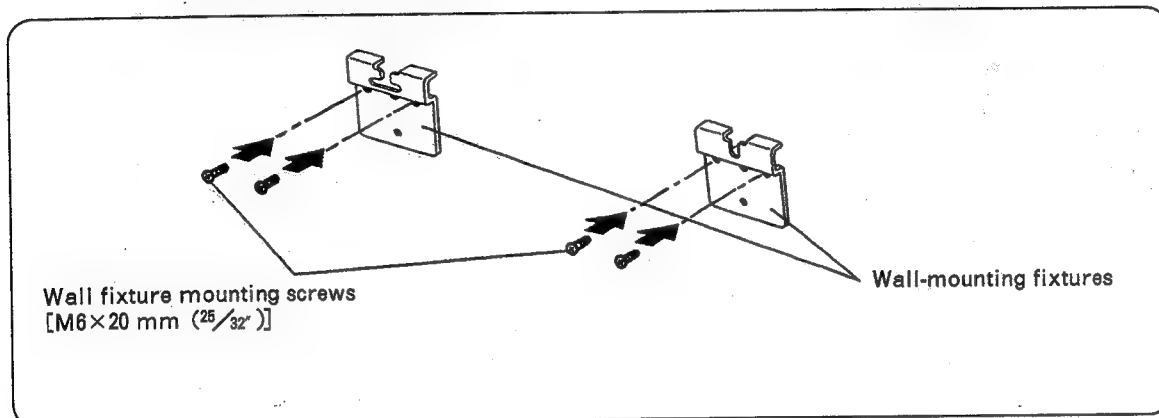
	Applicable Steps																
	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯	⑰
Wall/Floor mounted Type																	
Wall mounted Type Installation	○		○	○	○	○	○	○	○				○	○	○	○	○
Floor mounted Type Installation (One Person Installation)		○	○	○	○	○	○			○	○	○	○	○	○	○	○

① Preparation-1 (Wall mounted Type)

Ensure there is a Power Receptacle with in the mounting position of Electronic Print Board.

First confirm that the wall strength is fully sufficient to support the electronic print board.

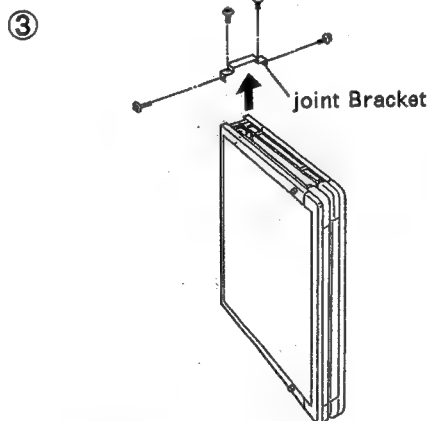
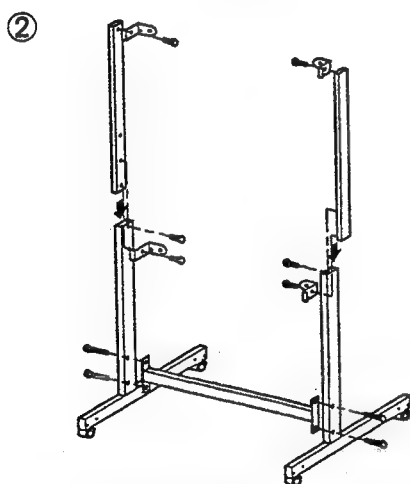
CAUTION: The wall must be capable of supporting at least 87 kg (about 192 lb) for KX-B620
The wall must be capable of supporting at least 82 kg (about 181 lb) for KX-B520



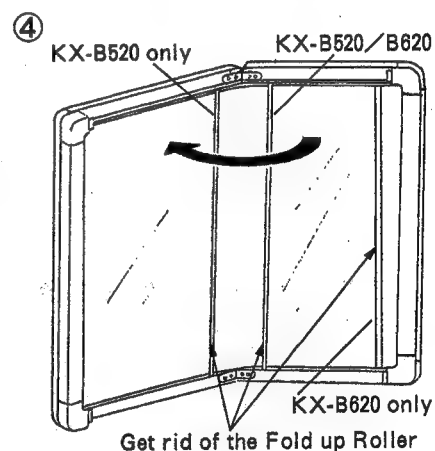
- The wall mounting fixtures can be mounted at one of three intervals: 75 cm (2' 5 17/32"), 100 cm (3' 3 3/8"), 122 cm (4' 1 1/32").
- Be sure the two wall fixtures are level with each other.
- Please use the proper type screw to secure the wall fixtures for the various wall materials.

[Only U.S.A.

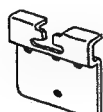
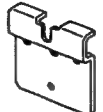

The four screws (installation above) used to secure the wall-mounting fixtures are not provided. Proper mounting screw (E.G. MOLLY BOLTS) should obtained to properly secure the Wall-mounting fixtures.



See the item
"Assembly of the stand (KX-B06C/06CS)
for the electronic print board (KX-B520)".

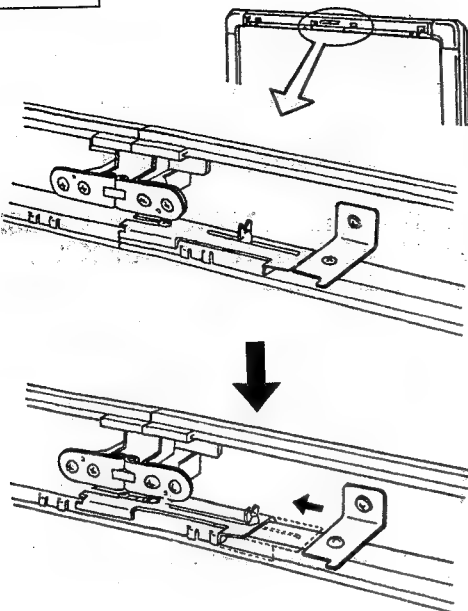


● Accessories for Wall-mounting:

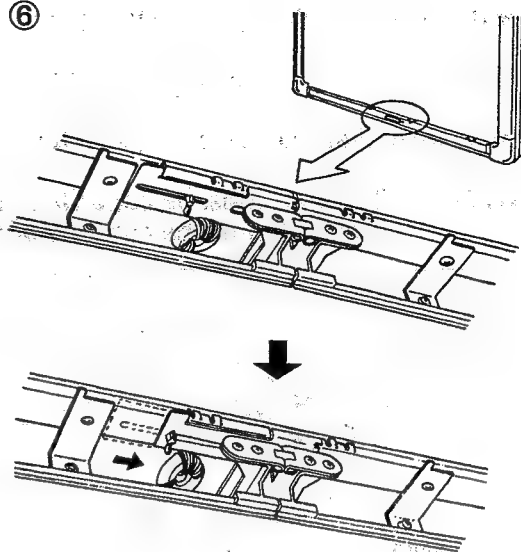
 <p>× 1</p> <p>[Wall-mounting Fixture: for Adjustment]</p>	 <p>× 1</p> <p>[Wall-mounting Fixture: for Fixing]</p>	 <p>× 4</p> <p>[M6× 20 mm (25/32")]</p> <p>Mounting Screws are not provided with U.S.A. model.</p>
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KX-B620 Series
KX-B520 Series

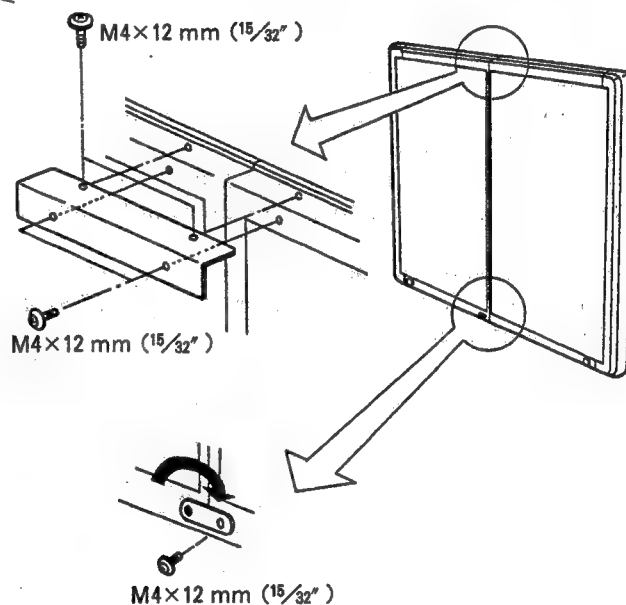
⑤



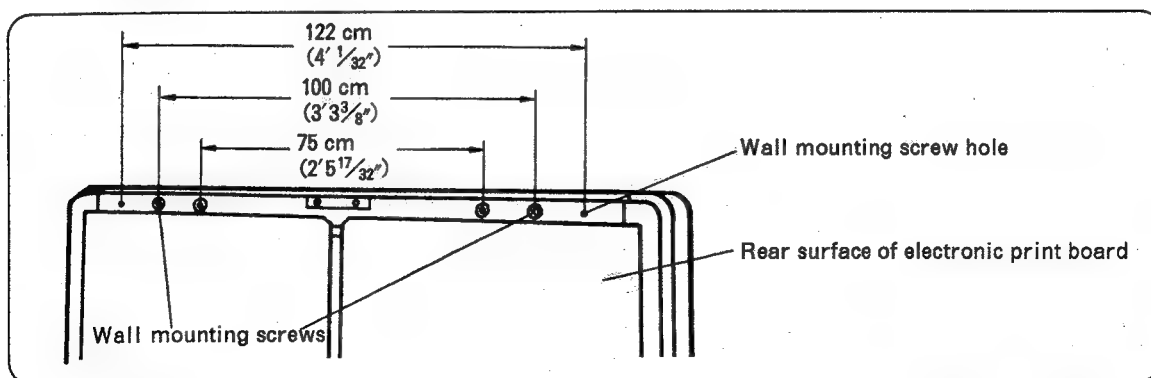
⑥



⑦

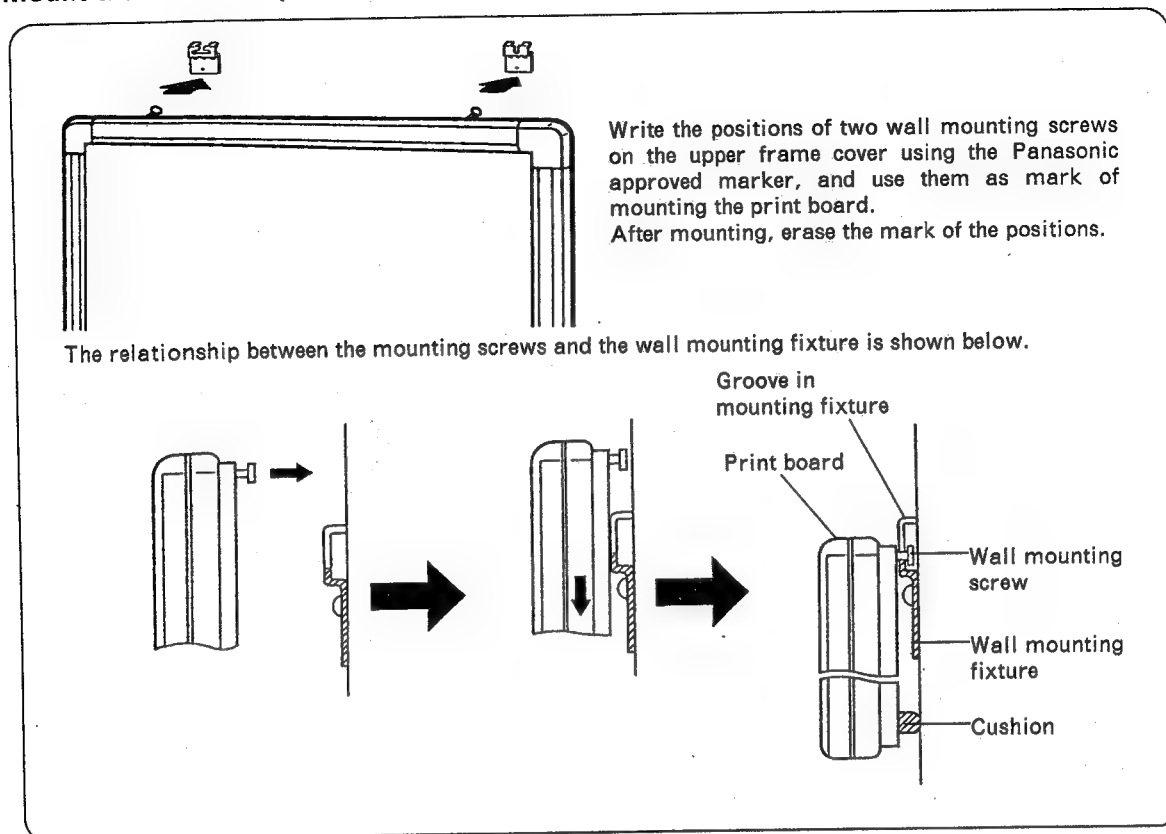


⑧ Install the wall mounting screws at the desired interval.



- The mounting screws may be installed at one of three intervals: 75 cm ($2' 5 \frac{17}{32}''$), 100 cm ($3' 3 \frac{3}{8}''$), 122 cm ($4' 1 \frac{1}{32}''$). Be sure to install the screws at the same mounting interval selected in part①.
- The wall mounting screws have been factory installed at the 100 cm ($3' 3 \frac{3}{8}''$) position.
- Tighten the mounting screws securely. Even if the factory-installed mounting interval is selected, be sure to retighten the screws before use.

⑨ Mount the electronic print board on the wall mounting fixtures.



- When mounting the electronic print board, avoid banging it against the wall or otherwise causing impacts.

Impacts may cause damage to the internal fluorescent lamp or other parts.

- Set so that the cushion on the rear side of the board contacts the wall in a flat position.

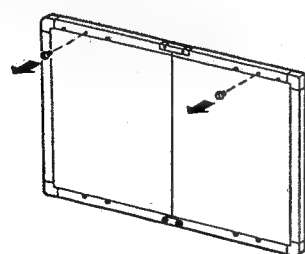
■NOTE: After mounting the electronic print board, check the following points:

- Pull the electronic print board forward slightly and confirm that the mounting screws are hooked firmly inside the mounting fixtures.

- Place weight gently on the electronic print board and confirm that the wall is strong enough to support the electronic print board.

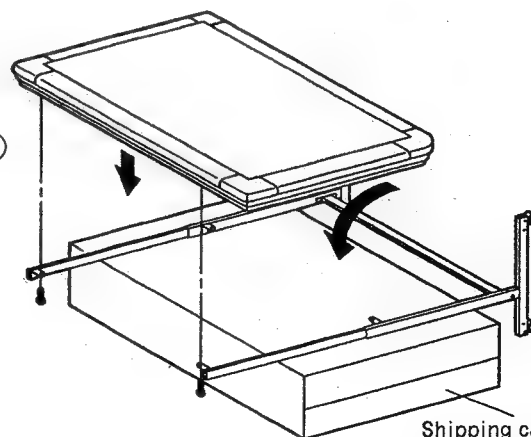
*To allow the electronic print board to be used in a stand setting, use of the optional stand (KX-B06C/06CS) is recommended.

⑩



Remove the two screws, then use them for safe keeping in step ⑬.

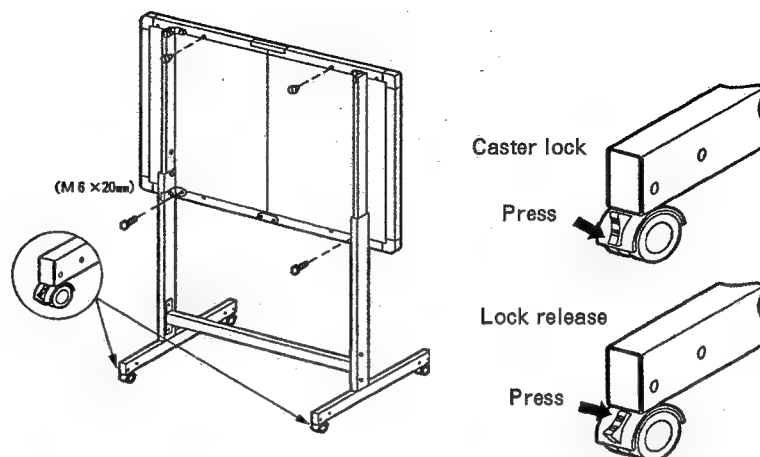
⑪



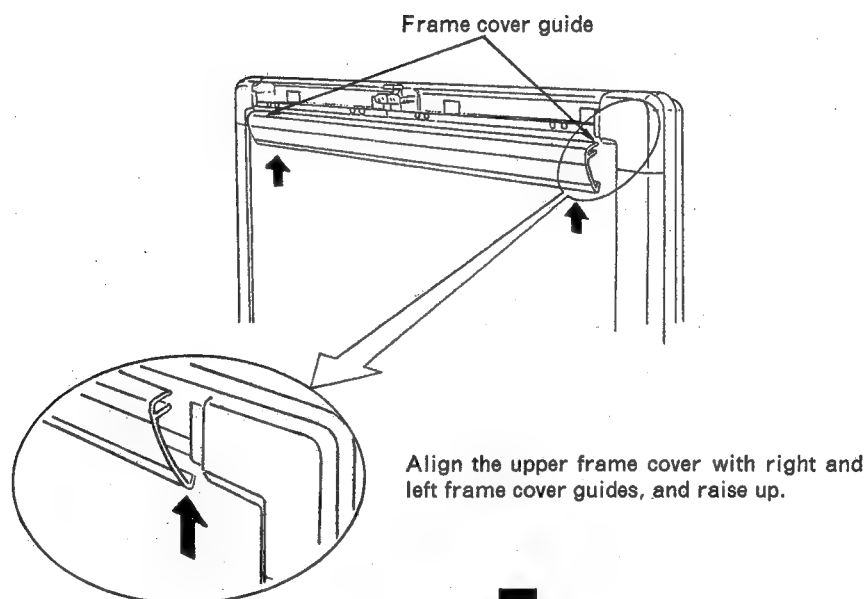
Shipping carton for
KX-B620/B520

KX-B620 Series
KX-B520 Series

⑫



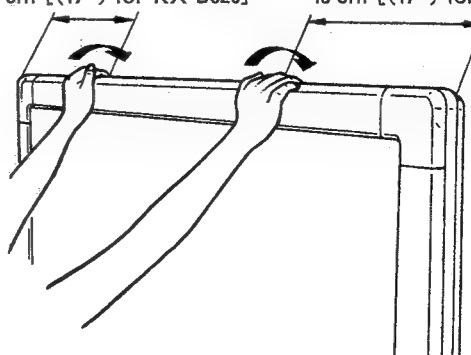
⑬



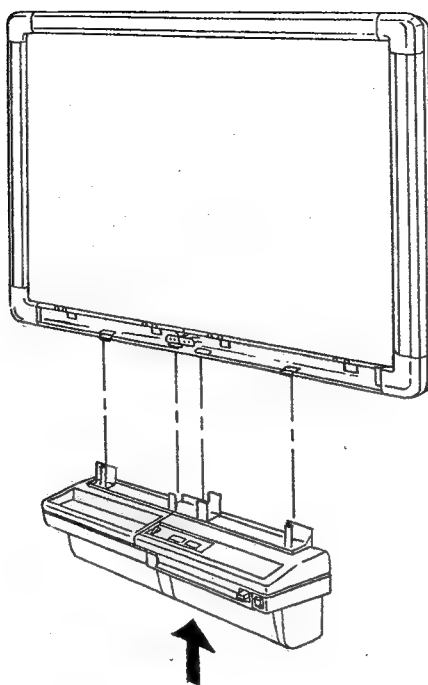
52 cm [(20.5") for KX-B620]
 43 cm [(17") for KX-B520]

52 cm [(20.5") for KX-B620]
 43 cm [(17") for KX-B520]

Place your hands at points about 52 cm [(20.5") for KX-B620] or 43 cm [(17") for KX-B520] from the right and left ends, and raise the upper cover, pressing in the direction of the arrows until the cover clicks into place.



⑭

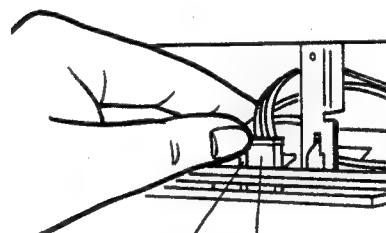


Lift up the printer section and press into the board until it clicks into place.

■ To disassemble the electronic print board:

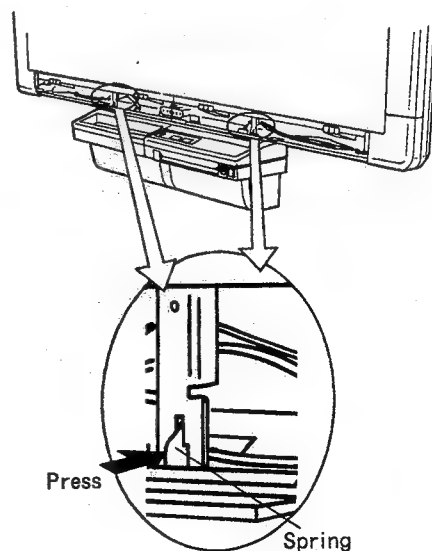
Reverse the previous steps (from step 12 to step 1) .

- To disconnect the connector from the electronic print board, grasp the lock of the connector as shown at the right, then pull out.



Lock Connector for print board and printer section

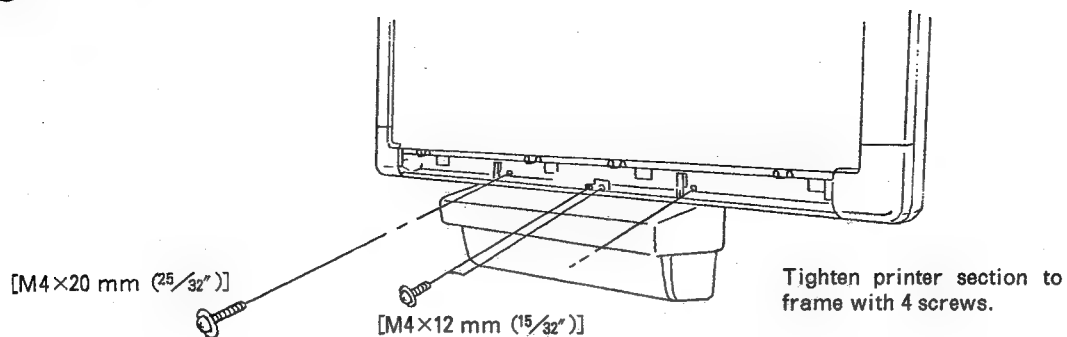
- To disconnect the printer section from the electronic print board, press two springs simultaneously on the right and left mounting fixtures for the printer section as shown at the right while lifting up the printer section.



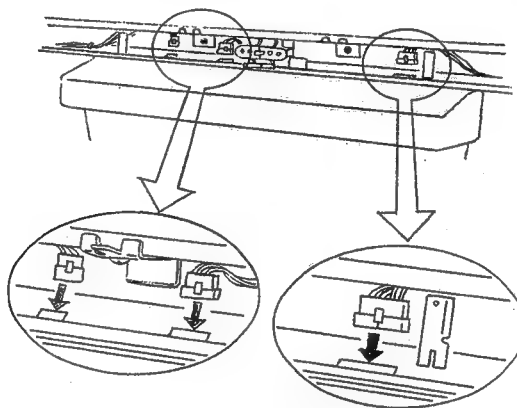
- After assembly, moisten a clean soft cloth with water, wring well, and wipe the film surface gently.

KX-B620 Series
KX-B520 Series

⑮

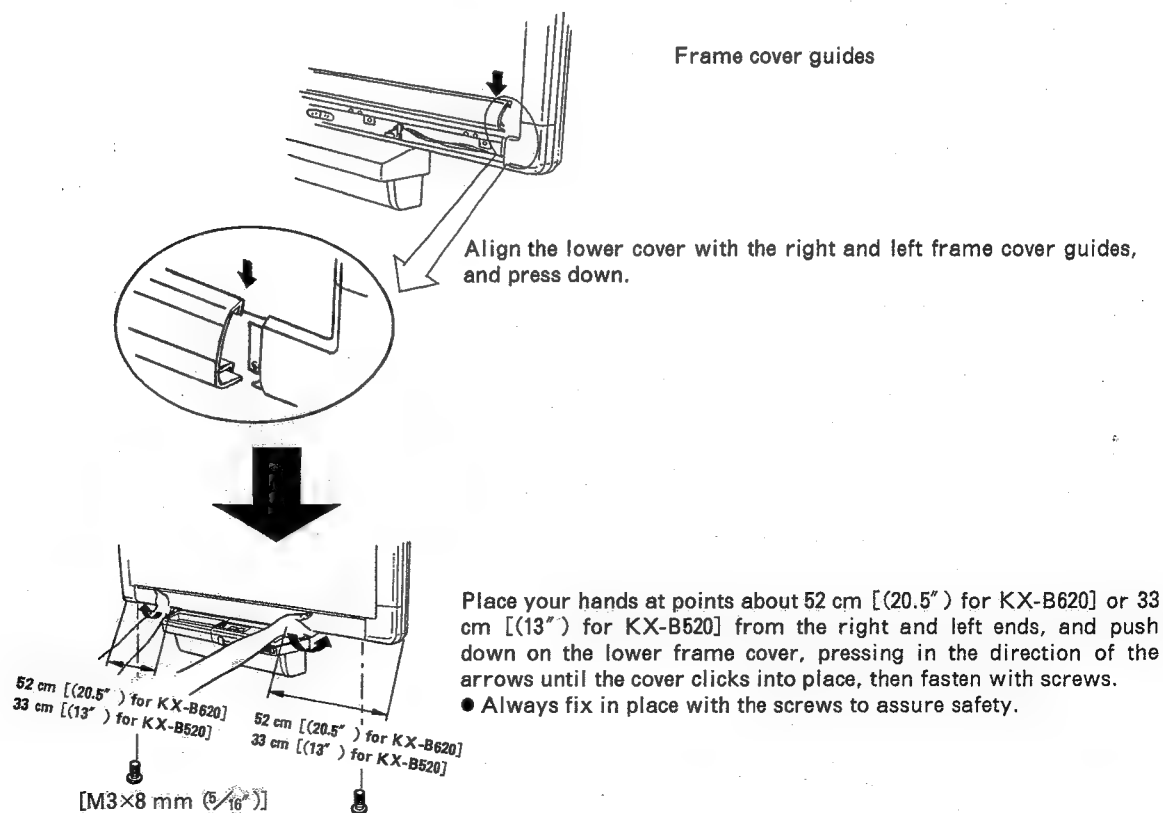


⑯



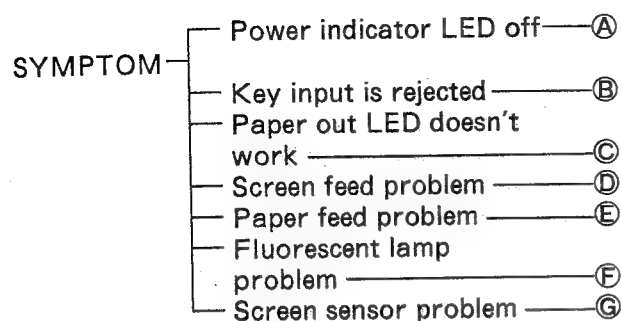
Connect the connectors from the print board securely to their receptacles.

⑰



10. TROUBLESHOOTING GUIDE

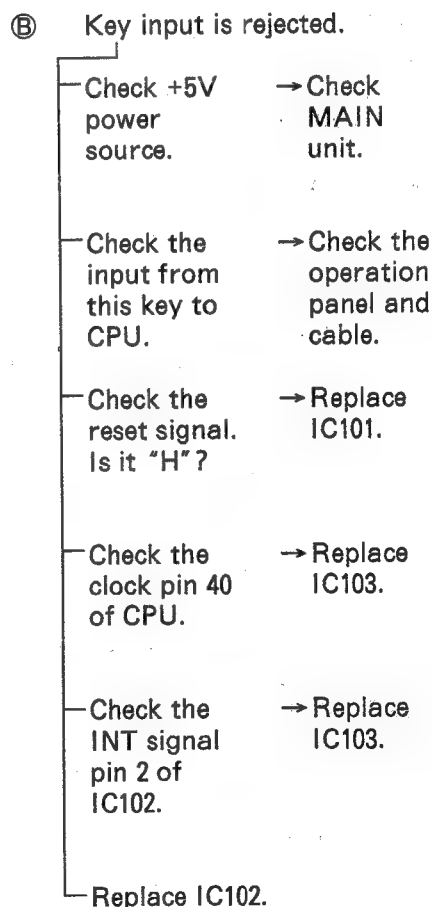
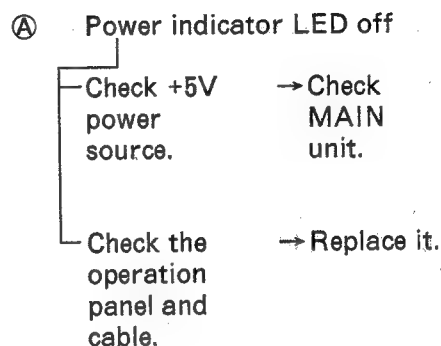
10-1. FAULTY FUNCTION



Check from the first symptom in alphabetical order.

- ① Power indicator LED off
Check +5V power source first.
It will indicate whether the trouble is in the MAIN unit or another area.
- ② Key input is rejected.
In this case also, check +5V power source first.
Next the control and operation boards must be checked.
- ③ Paper out LED doesn't work.
If power indicator is on and then paper is out, this LED must be on.
If not, the control board must be checked.
One of check points is the power source for IC106.
- ④ Screen feed problem
Mechanical problem must be checked first.
Is the installed condition of the motor and gear correct?
Next check the inputs and the outputs of motor driver IC104.
- ⑤ Paper feed problem
Same as ④ except motor driver IC105.
- ⑥ Fluorescent lamp problem
Input signals LAMPON, LAMPPRE of IC106 and +5V power source must be checked.
If it's OK, LAMP DRIVE CIRCUIT is perhaps damaged.

- ⑦ Screen sensor problem
First check the screen condition.
If it is loose, the screen sensor sometimes can't sense the screen home position.
If the screen is scrolling without stopping, check the position of tension spring screws located the left side of the panel.
Next check the screen home position sensor board.



KX-B620 Series KX-B520 Series

© Paper out LED doesn't work.

- Check the input pin 30 of CPU. (IC102) It is "H" when paper is out. → Check the micro switch installed condition. → Replace the micro switch.
- Check the ENDLED signal pin 3 of IC106. Is it "L" ? → Replace IC102.
- Check the output pin 4 of IC106. Is it "L" ? → Replace IC106.
- Check the operation panel and cable.

④ Screen feed problem

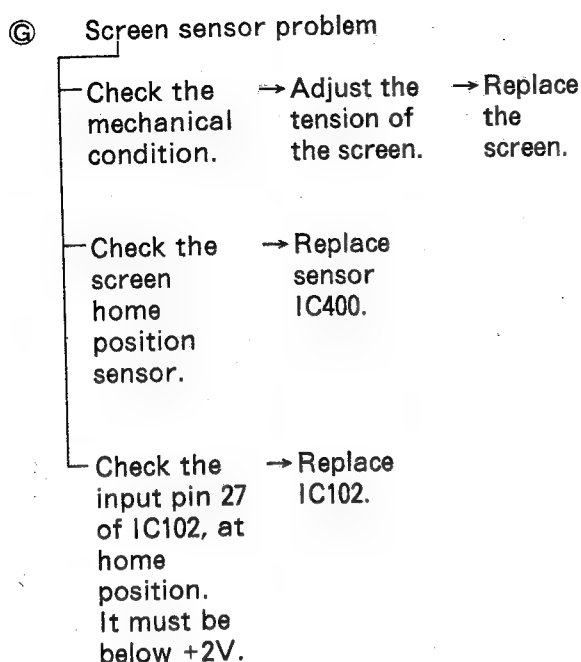
- Check the mechanical condition. → reassemble
- Check the input pins 1, 5, 8, 12 of IC104. → Replace IC102.
- Check the +24V cable. → Replace it.
- Check the +24V power source pins 3, 10 of IC104. → Check ZD100, ZD101. → Replace them.
- Check the output pins 2, 4, 9, 11 of IC104. → Replace IC104.
- Replace the motor.

⑤ Paper feed problem

- Check the mechanical condition. → reassemble
- Check the input pins 1, 5, 8, 12 of IC105. → Replace IC102.
- Check the +24V power source pins 3, 10 of IC105. → Check ZD102, ZD103. → Replace them.
- Check the output pins 2, 4, 9, 11 of IC105. → Replace IC105.
- Replace the motor.

⑥ Fluorescent lamp problem

- Check the input pins 5, 9 of IC106. → Replace IC102.
- Check the +24V power source. → Check the MAIN unit.
- Check the output pins 6, 8 of IC106. → Replace IC106.
- Check the LAMP DRIVE CIRCUIT.
- Replace the LAMP.



10-2. FAULTY COPY

SYMPTOM	No printing	Ⓐ
	All black	Ⓑ
	Dark printing	Ⓒ
	Faint printing	Ⓓ
	Density difference between right and left	Ⓔ
	White line	Ⓕ
	White band	Ⓖ
	Black line	Ⓗ
	Black band	Ⓘ

First check the mechanical condition.
Next the thermal head signals and power sources must be checked, it will indicate whether the thermal head is faulty or not.
If all the above checks are good, the thermal head is faulty.
If not, check the CCD board and control board.

- Ⓐ No printing
The thermal head signals must be checked.
If they are proper, the thermal head is faulty.
- Ⓑ All black
It is very rare that the thermal head is faulty.
Perhaps the CCD board or the control board is bad.

- Ⓒ Dark printing
Check the following.
- Faulty optical axis
 - Lack of light of the fluorescent lamp
 - Faulty CCD board
 - Faulty control board
 - Faulty mechanical condition of the screen
 - If a chart is attached, attach it again properly.

- Ⓓ Faint Printing
Check the following.
- Poor contact between the thermal head and the platen
 - Dirty surface on blank area of the screen
 - Dirty surface of the mirror
 - Dirty surface of the lens
 - Dirty surface of the CCD
 - Dirty surface of the thermal head
 - Faulty optical adjustment
 - Faulty CCD board
 - Faulty control board

- Ⓔ Density difference between right and left
- Poor contact between the thermal head and the platen
 - Faulty optical adjustment

- Ⓕ White line
- Faulty thermal head
 - Dirty surface of the mirror
 - Dirty surface of the lens
 - Dirty surface of the CCD
 - Dirty surface on blank area of the screen

- Ⓖ White band
- Strobe pulses must be checked first.
 - Faulty thermal head

- Ⓗ Black line
- Dirty surface of the mirror
 - Faulty optical adjustment

- Ⓘ Black band
- Faulty optical adjustment
 - Faulty thermal head

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Ⓐ No printing

- Check the mechanical condition of the printer. → Close the printer correctly.
- Check the +24V CN17 pin 1-4. → Check the cable.
- Check the video signal TP2 in the CCD board. → Check the +12V power source and clock signals to CCD IC201. → Replace IC201.
- Check the analog circuit in the control board (IC109 pin 15).
- Check the HDATA LATCH CLKHD signals in the control board. → Check IC103, IC109. → Replace.
- Faulty thermal head → Replace it.

Ⓑ All black

- Check the video signal TP2 in the CCD board. → Check the clock signals to CCD IC201. → Replace IC201.
- Check the analog signal IC 109 pin 15 in the control board.
- Check the HDATA LATCH CLKHD signals in the control board. → Check IC103, IC109. → Replace.
- Faulty thermal head → Replace it.

Ⓒ Dark printing

- Check the optical axis adjustment. → Adjust.
- Check the screen tension. → Replace.
- Check the fluorescent lamp. → Replace.
- Check the CCD board.
- Check the control board.

Ⓓ Faint printing

- Check the printer mechanical condition. → Close the printer correctly.
- Check the white blank area of the screen. → Clean this area.
- Check the surface of the lens. → Clean.
- Check the surface of the CCD. → Clean.
- Check the surface of the thermal head. → Clean.
- Check the optical axis. → Adjust it correctly.
- Check the video signal in the CCD board. → Replace.
- Check the control board.

Ⓔ Density difference between right and left

- Check the printer mechanical condition. → Close the printer correctly.
- Check the optical axis. → Adjust it correctly.

Ⓔ White line

- Check the surface of the lens. → Clean.
- Check the surface of the CCD. → Clean.
- Faulty thermal head. → Replace.

Ⓖ White band

- Check the strobe signals. → Check the control board.
- Check the LATCH signal. → Check the control board.
- Faulty thermal head. → Replace.

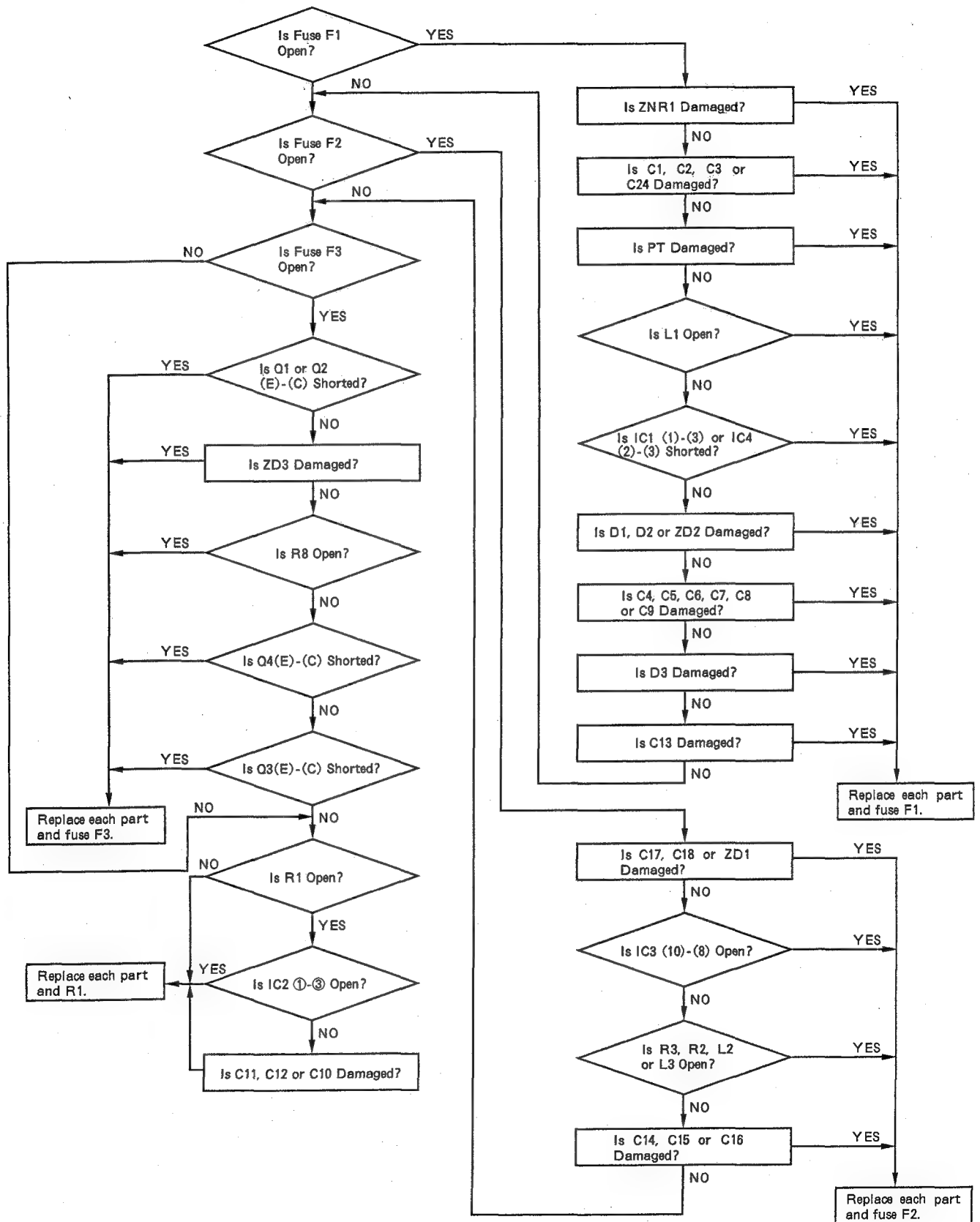
Ⓕ Black line

- Check the surface of the mirror. → Clean.
- Check the optical axis. → Adjust.

Ⓛ Black band

- Check the optical axis. → Adjust.
- Faulty thermal head. → Replace.

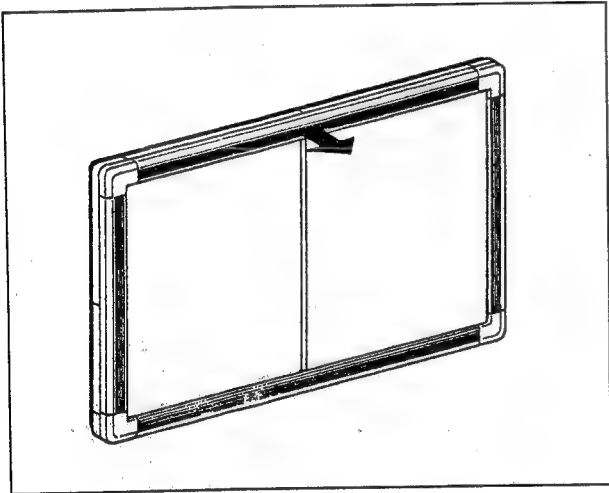
10-3. TROUBLESHOOTING FOR MAIN UNIT



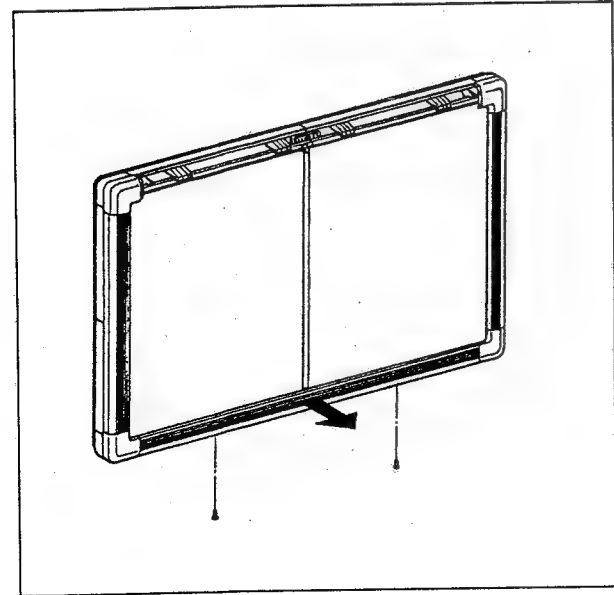
11. DISASSEMBLY AND EXCHANGE

Exchange Parts	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯
● Fluorescent lamp	○	○	○				●									
● Screen	○	○	○	○		●										
● CCD Board	○	○	○	○	○		●									
● Screen feed motor	○	○	○	○	●											
● Control Board		○							○	○	○	●				
● Thermal head		○							○	○	○	○	●			
● Power Supply Unit (PSU)		○							○					○	●	
● Paper feed motor		○							○	○						●

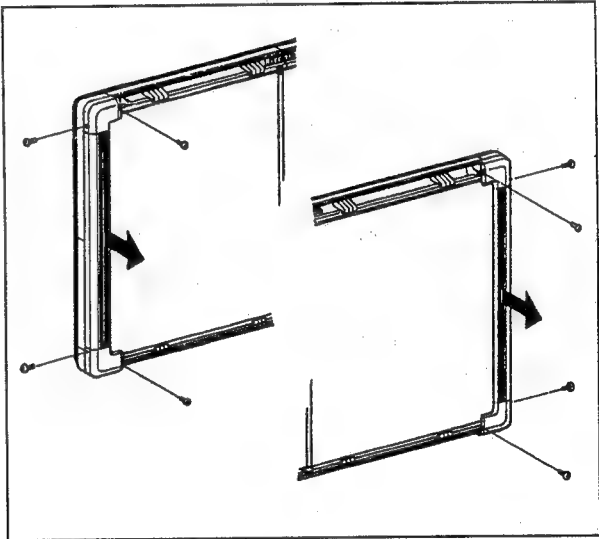
① Remove the top of the Frame Cover B.



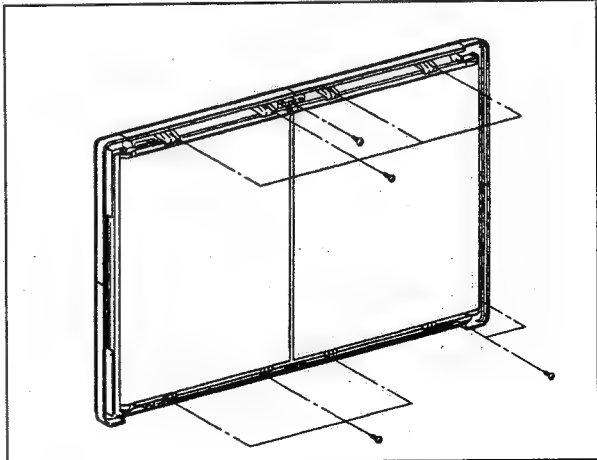
② Remove 2 screws on the bottom of the Frame Cover C.



③ Remove 8 screws on the lower left and upper left of the Frame Cover A, and remove the left part of the Frame Cover A.



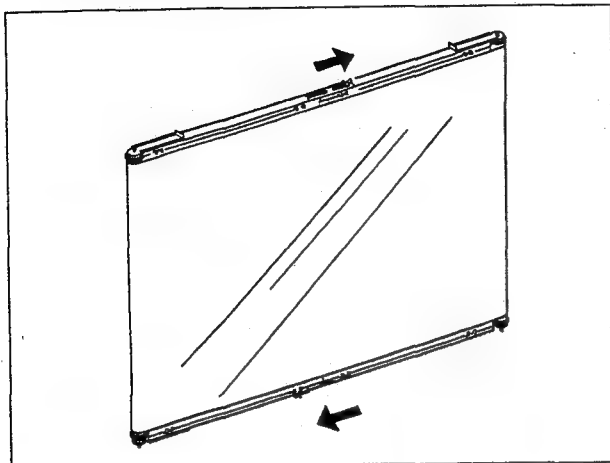
④ Remove 2 screws for fixing the screen feed motor bracket, 1 screw for fixing the core and 7 screws to remove the middle plate.



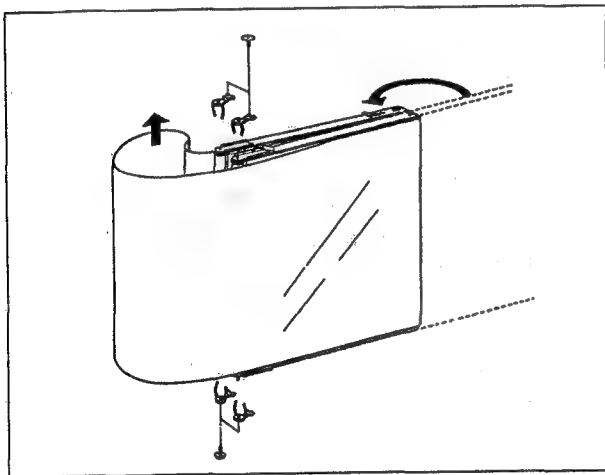
* The screen drive motor connector must be disconnected before removing the middle plate assembly.

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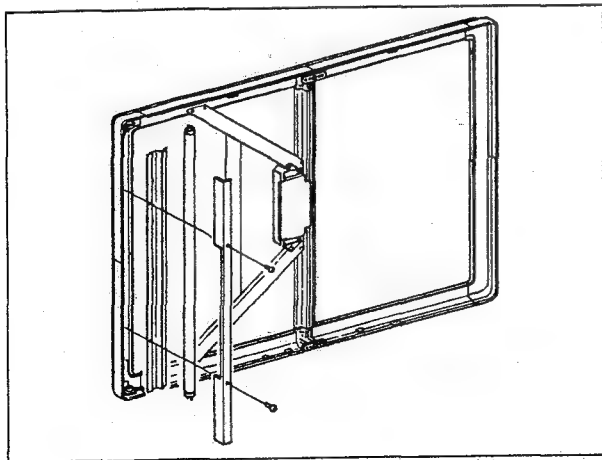
- ⑤ Then loosen 2 wing bolts, slide the upper and lower slide brackets to the direction of the allows separately.



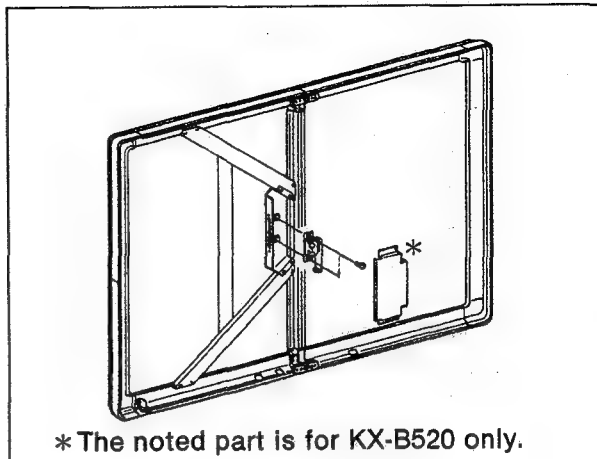
- ⑥ Remove 4 screws which secure each screen holder, and remove holders. Then, turn the middle plate to the direction of the allow to loosen the screen. Replace the screen. Refer to the separate sheet for tension adjustment of the screen.



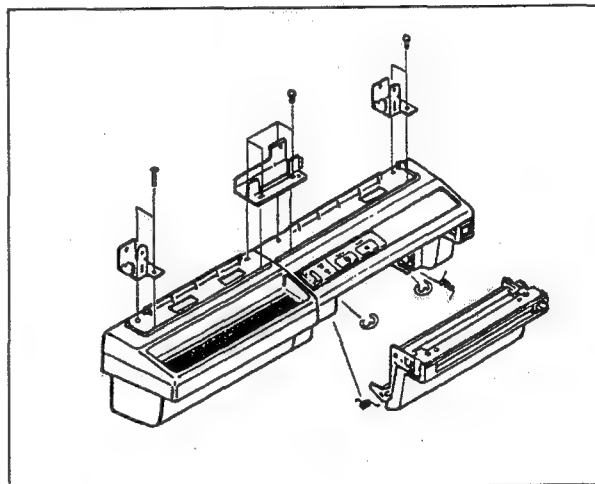
- ⑦ Remove 2 screws, and remove the Bracket L Frame plate and the Bracket lamp shield. Replace the fluorescent lamp.



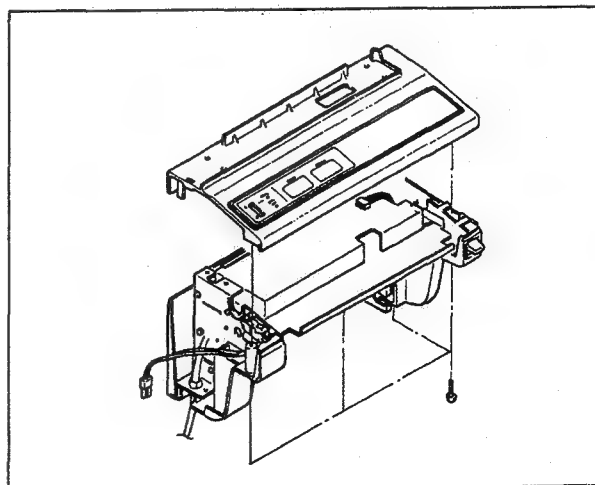
- ⑧ Remove 2 screws that fix the CCD unit and replace it. Refer to the separate sheet for adjustment.



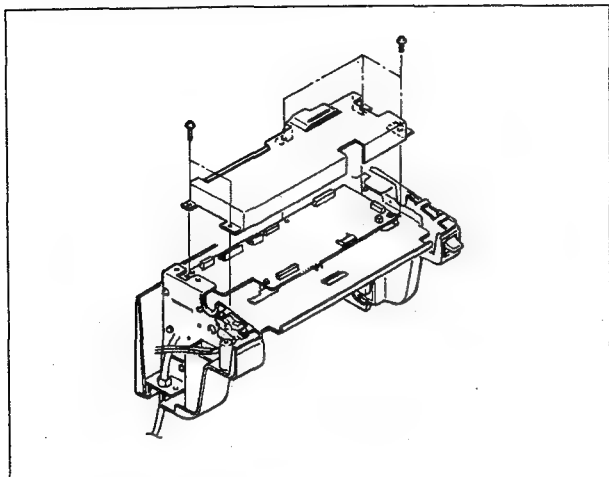
- ⑨ Release 2 locking portions and remove the printer section, remove 8 screws that fix the printer section. Then open the printer door and remove 2 E-rings and 2 springs to remove the opening/closing section.



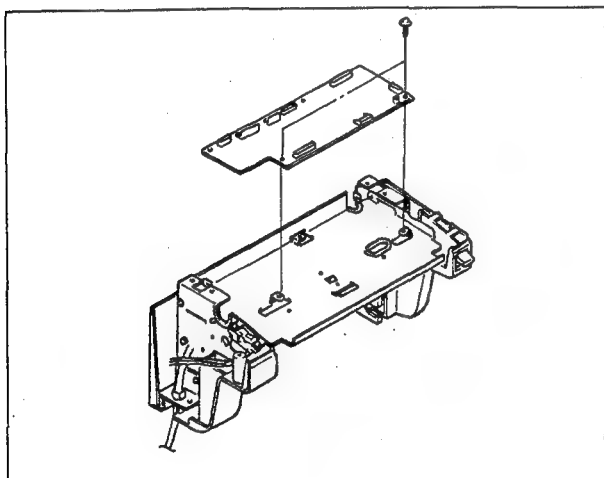
- ⑩ Remove 4 screws, disconnect the connector (LED to Control Board), and remove the Printer Cover Upper.



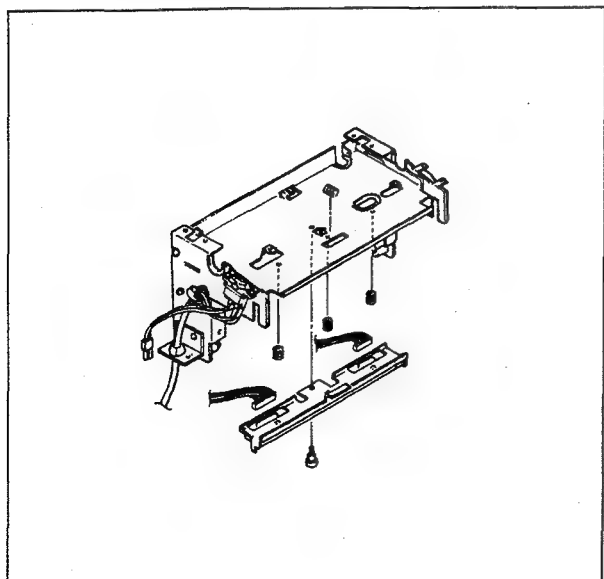
- ⑪ Remove 5 screws, disconnect the connector (Shield plate to Control Board), and remove the shield Cover Control Board.



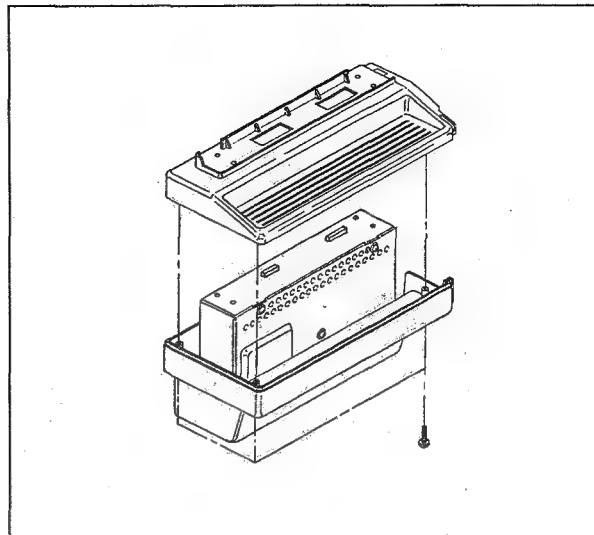
- ⑫ Disconnect the connector, remove 2 screws, and remove the Control Board for replacement.



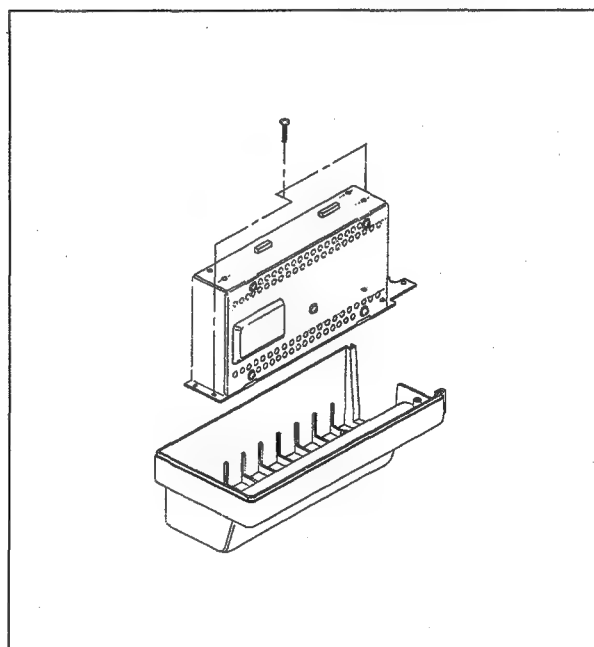
- ⑬ Remove the upper springs and 1 screw, and remove the thermal head.



- ⑭ Remove 3 screws and remove the Tray Upper.

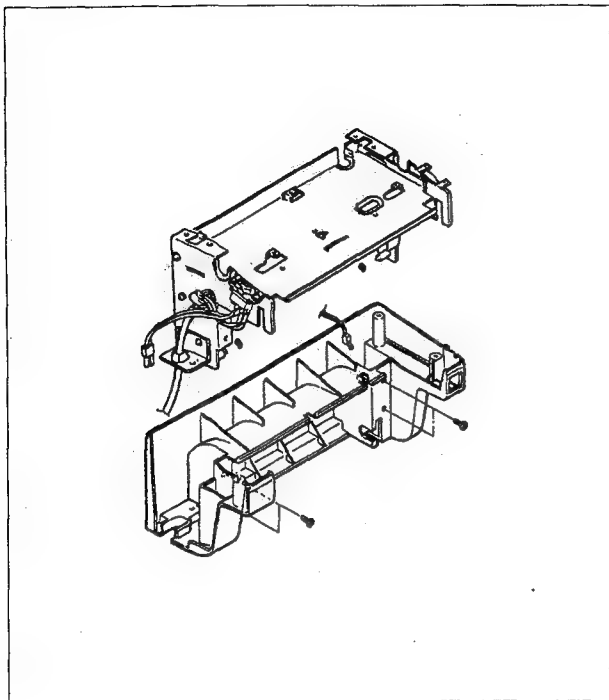


- ⑮ Disconnect the connector (AC to Main) and remove 2 screws, and replace the PSU.



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- ⑩ Remove 6 screws to remove the lower cover.
Replace the motor.

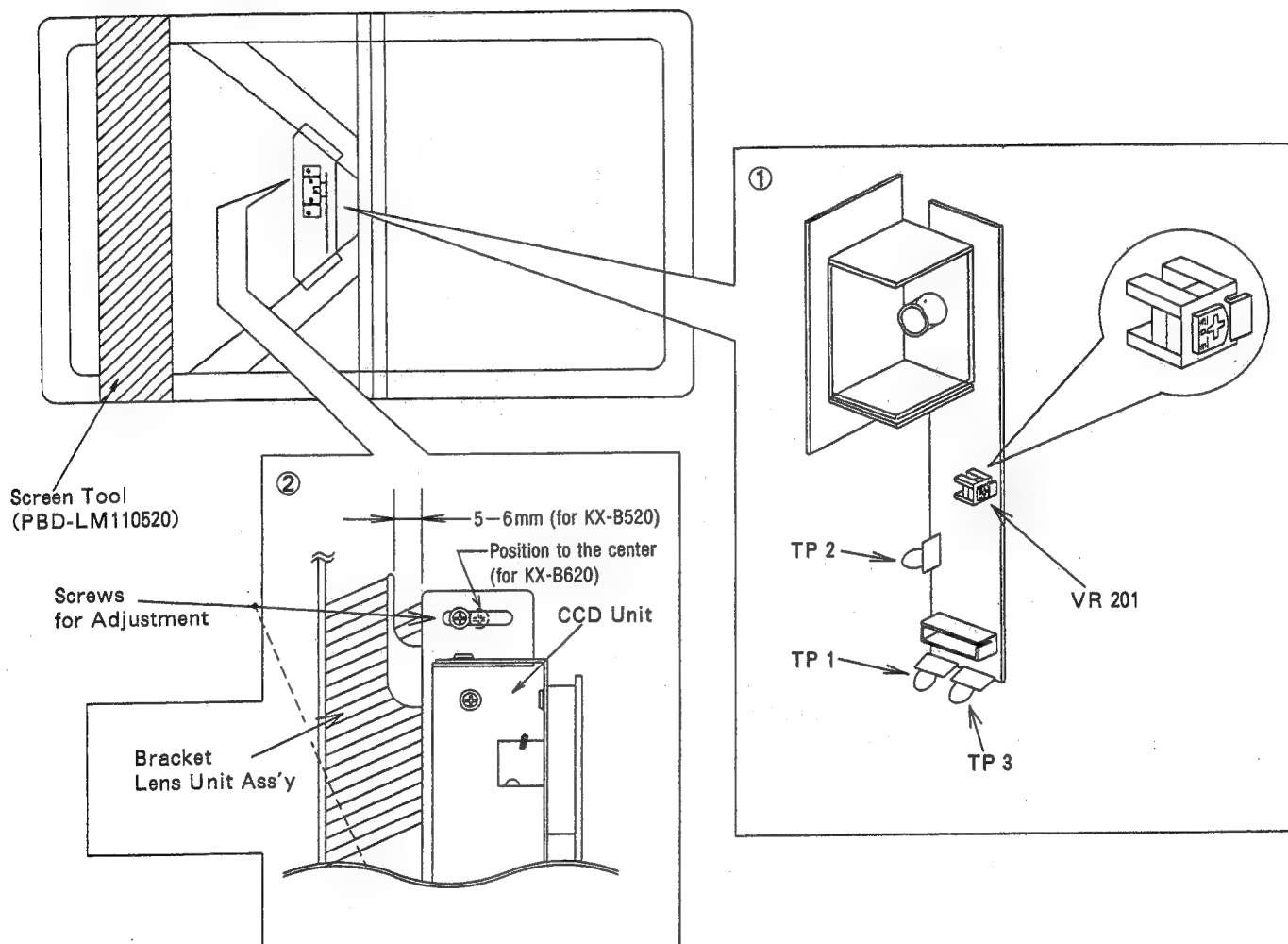


12. ADJUSTMENTS

CCD Adjustment Procedure

① Adjustment Tool set

Remove all the parts necessary to gain access to the CCD unit (Use the "DISASSEMBLY AND EXCHANGE" steps ①—④ in section 11).
Set the Screen Tool to the Print Board.



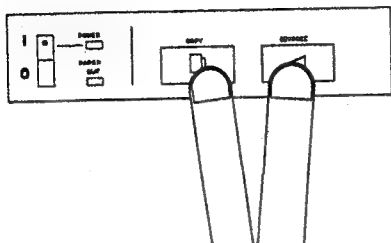
- ② Set the oscilloscope as follows (See ①) :
- CH 1 * * * TP 1 : DC Normal Mode 5V/DIV
 - CH 2 * * * TP 2 : AC Inverted Mode 1V/DIV
 - GND * * * TP 3
 - Time is 0.5 ms/DIV

- ③ Set VR201 as follows (See ①) :
- Adjust VR201 to about center position.

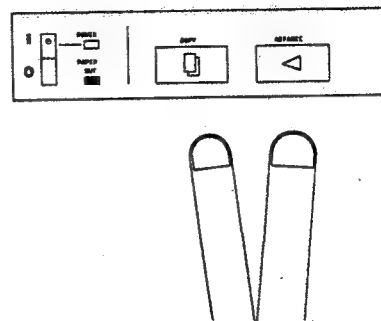
- ④ Set the CCD Unit as follows (See ②) :
- Set the Gap between the Bracket Lens Unit Ass'y and CCD Unit at 5-6 mm.

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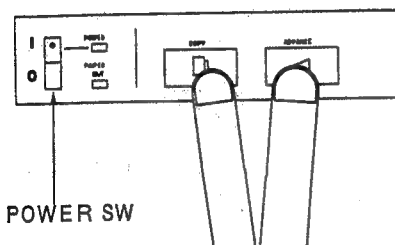
- ⑤ Press both the "COPY" and "ADVANCE" Keys simultaneously and hold them.



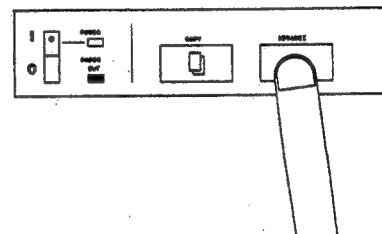
- ⑧ Remove both fingers.



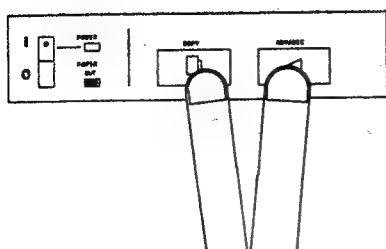
- ⑥ Turn on the POWER SW.



- ⑨ Press the "ADVANCE" Key (CCD Data Transfer Mode).



- ⑦ The "PAPER OUT" Indicator lights about 3 seconds later.



⑩ Horizontal Adjustment-1
(The Screen Tool position is 5 lines read position.)

Loosen 2 screws (Fig. 1) and set the peak value of the waveform to a maximum using the Adjustment Tool. Then, tighten 2 screws alternately.

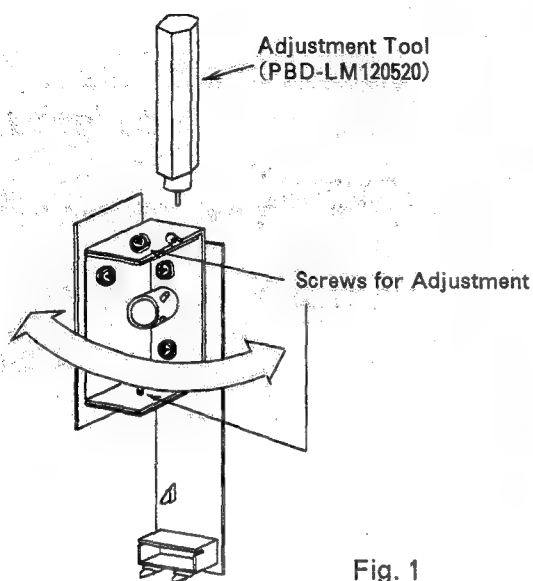
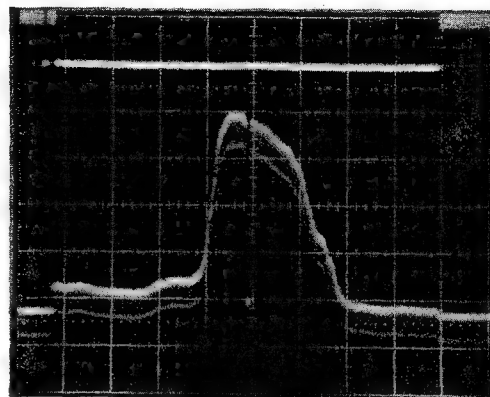


Fig. 1



⑪ Horizontal Adjustment-2
(The Screen Tool position is 5 lines read position.)

Loosen 2 screws (Fig. 2) and adjust the waveform to conform with Fig. 2. Then, tighten 2 screws alternately. The point of this adjustment is the shoulder of the both side waveform.

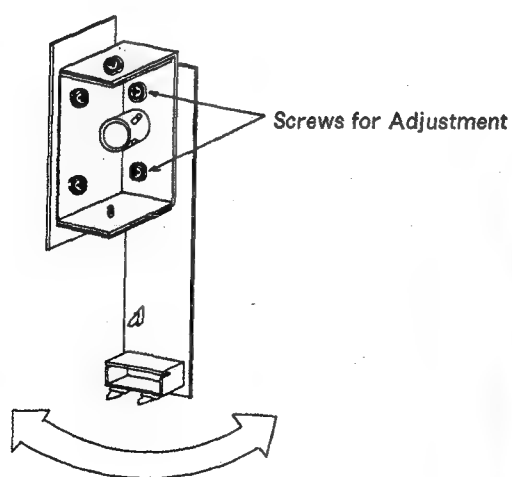
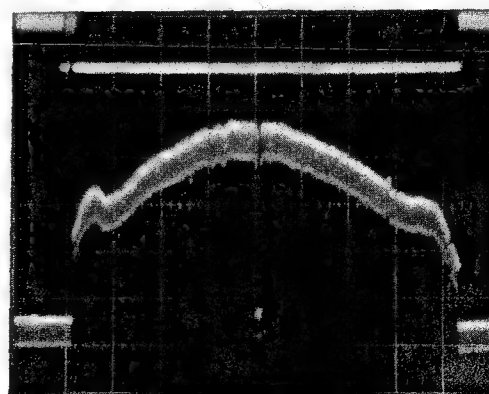


Fig. 2



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- ⑫ Slope Adjustment
 (The Screen Tool position is 5 lines read position.)

Loosen 2 screws and adjust the waveform to flat (Fig. 3) using the Bracket Light Interceptor. Then, tighten 2 screws alternately.

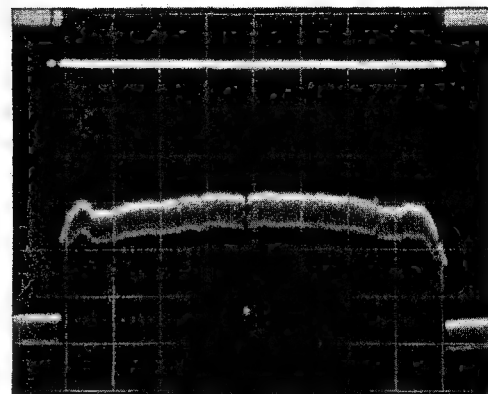
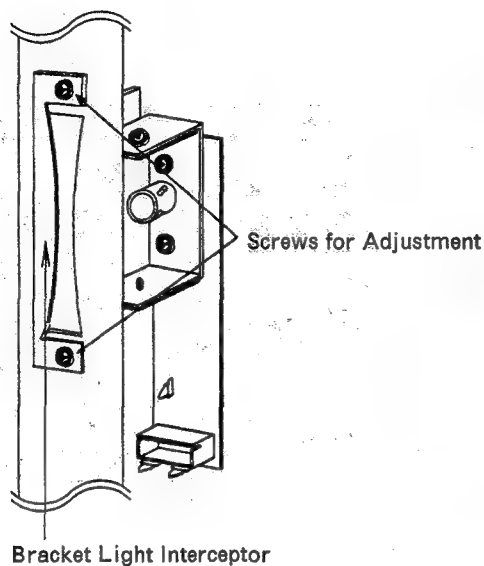


Fig. 3

- ⑬ Focus Adjustment
 (The Screen Tool position is 5 lines read position.)

Loosen the lens set screw and set the peak value of the second pulse V2 (Fig. 4) to a maximum using the Adjustment Tool.

Then, tighten the set screw. Put on a Lens Shield. The function of the Lens Shield is the cut of the useless light.

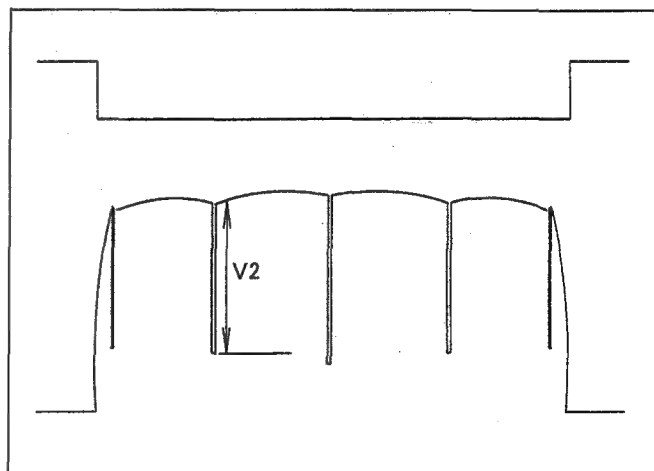
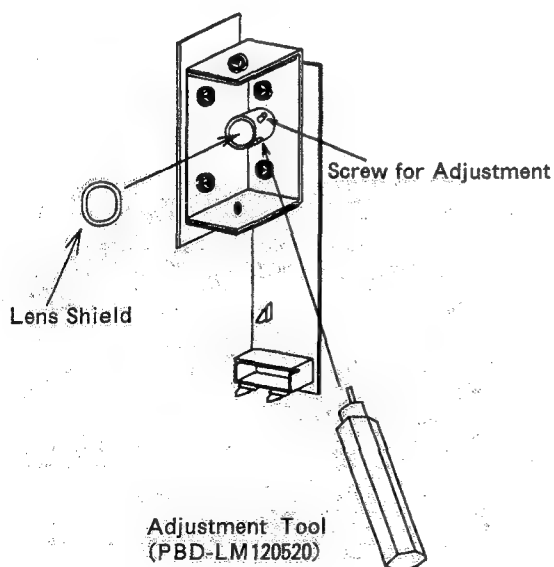


Fig. 4

- ⑭ Vertical Adjustment
(The Screen Tool position is 5 lines read position.)
(This adjustments time range is 50 μ s/DIV.)

Loosen 2 screws and adjust the reading width to conform with the waveform in Fig. 5.
Then, tighten 2 screws alternately.

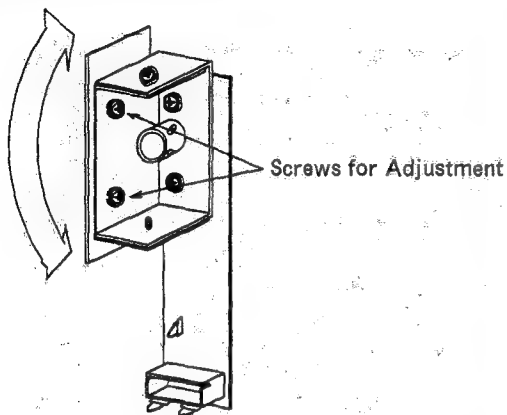
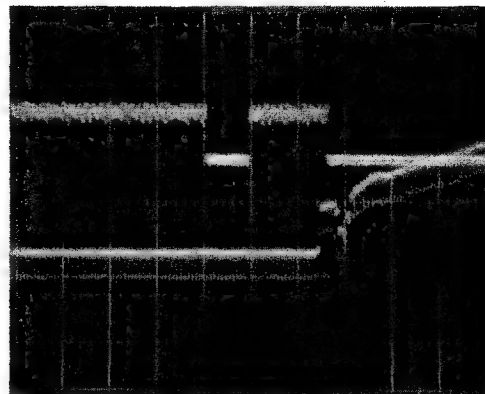


Fig. 5



If the Vertical Adjustment is impossible, loosen 2 screws and adjust the CCD unit to forward or backward (Fig. 6) .

Then, tighten 2 screws alternately.

Repeat "⑩ Horizontal Adjustment" to "⑭ Vertical Adjustment".

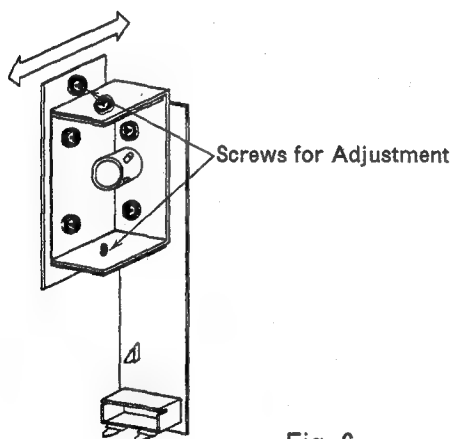


Fig. 6

- ⑮ Gain Adjustment
(The Screen Tool position is white area read position.)

Adjust VR201 to obtain the peak level of waveform (4.5V).

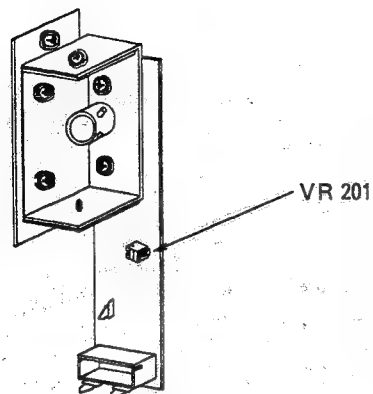


Fig. 7

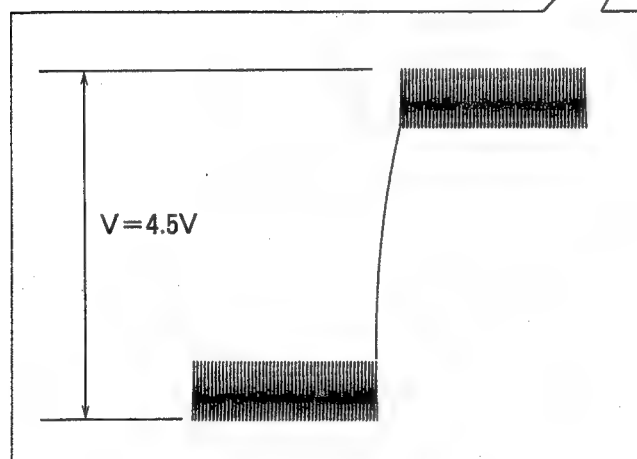
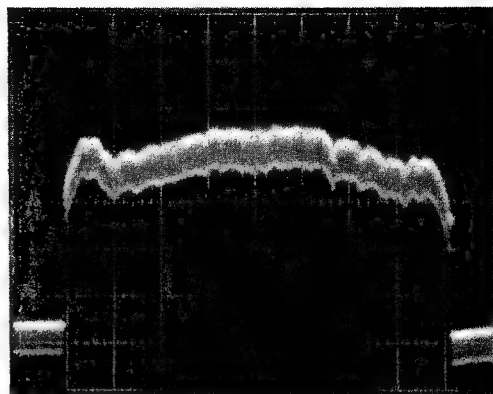


Fig. 8

13. CIRCUIT OPERATION

1. GENERAL BLOCK DIAGRAM AND FLOWCHART

The control section will be explained as shown in the block diagram.

- 1) CPU (IC102) makes the timing signals for control of other circuits, for example CCD, Thermal Head.
- 2) Gate Array (IC103) makes the signals for Thermal Head, CCD, Shading correcting and A/D convert LSI (IC109) from the signals of CPU.
- 3) LSI (IC109) compensates the shading distortion of the analog signal and converts it to the digital signal.
- 4) Thermal Head contains the heating elements for the dot matrix image printing.
- 5) CCD image sensor is a 1,024 bit linear image sensor, and executes reading the document on the screen.
- 6) Power Supply supplies +5V, +24V, +12V, -12V.
- 7) Lamp Driver drives the Lamp in a high frequency.
- 8) Motor Drivers drive the Screen Feed Motor and Paper Feed Motor.

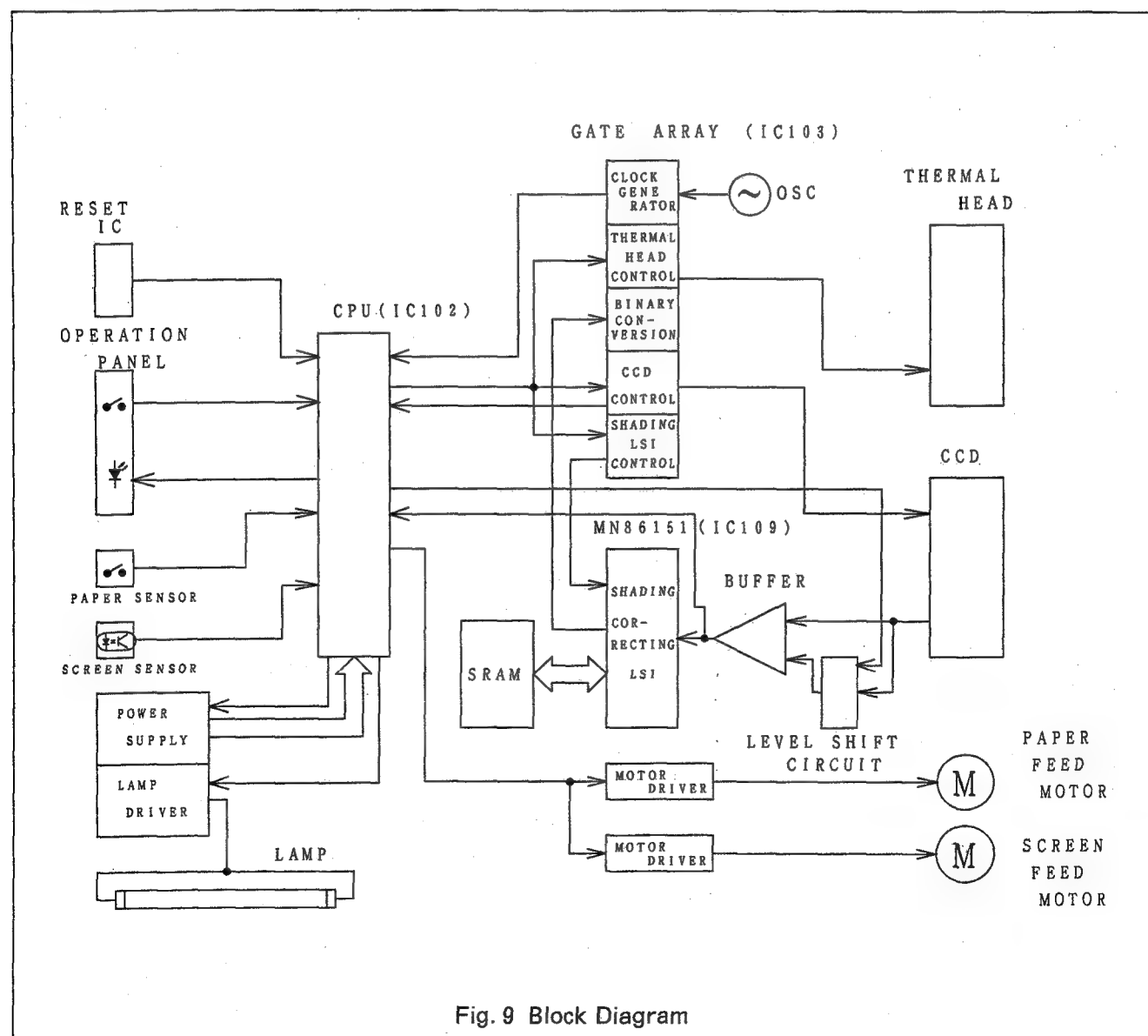


Fig. 9 Block Diagram

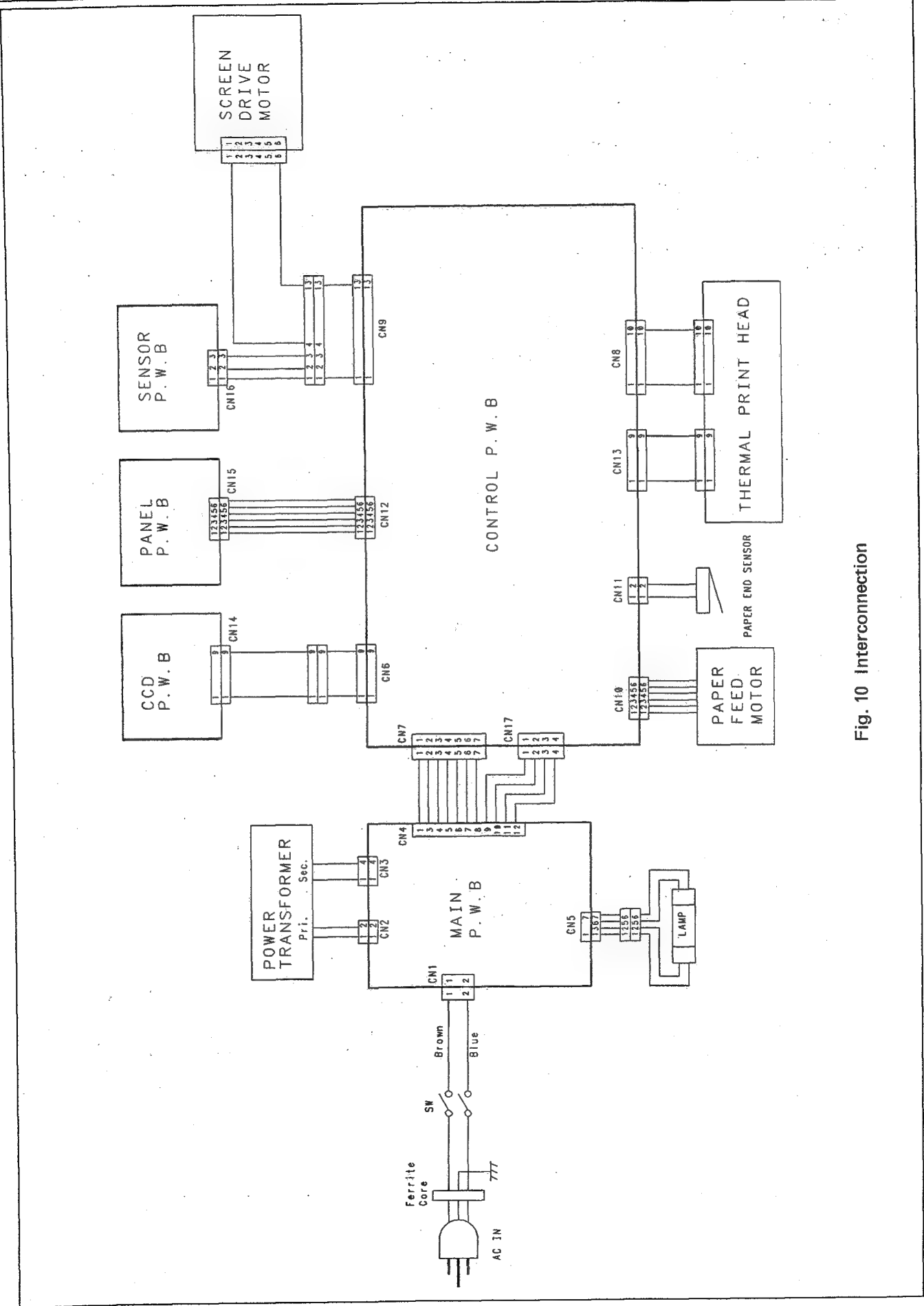
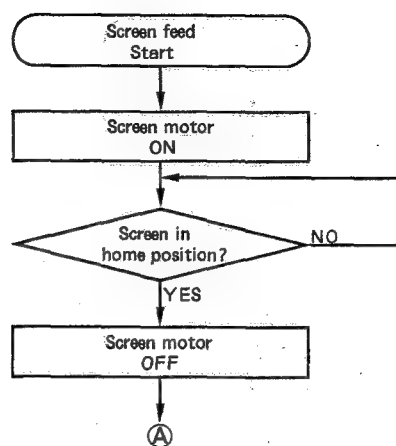
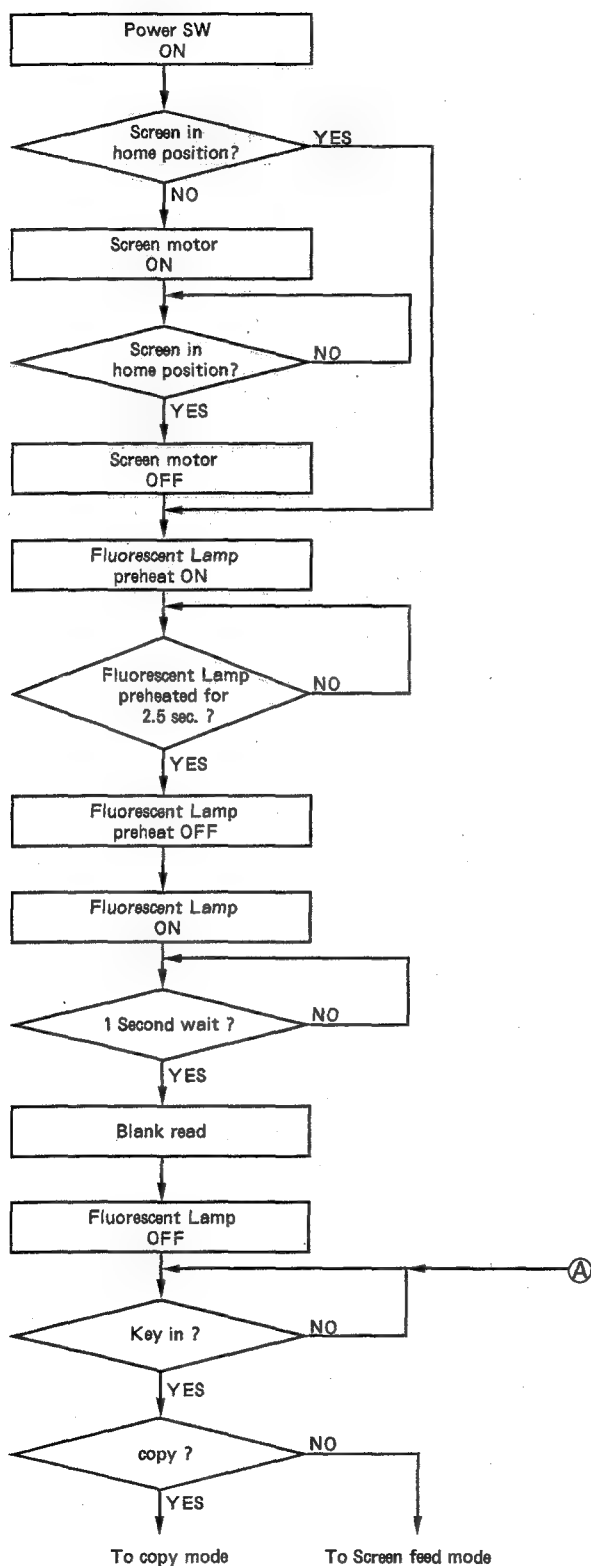
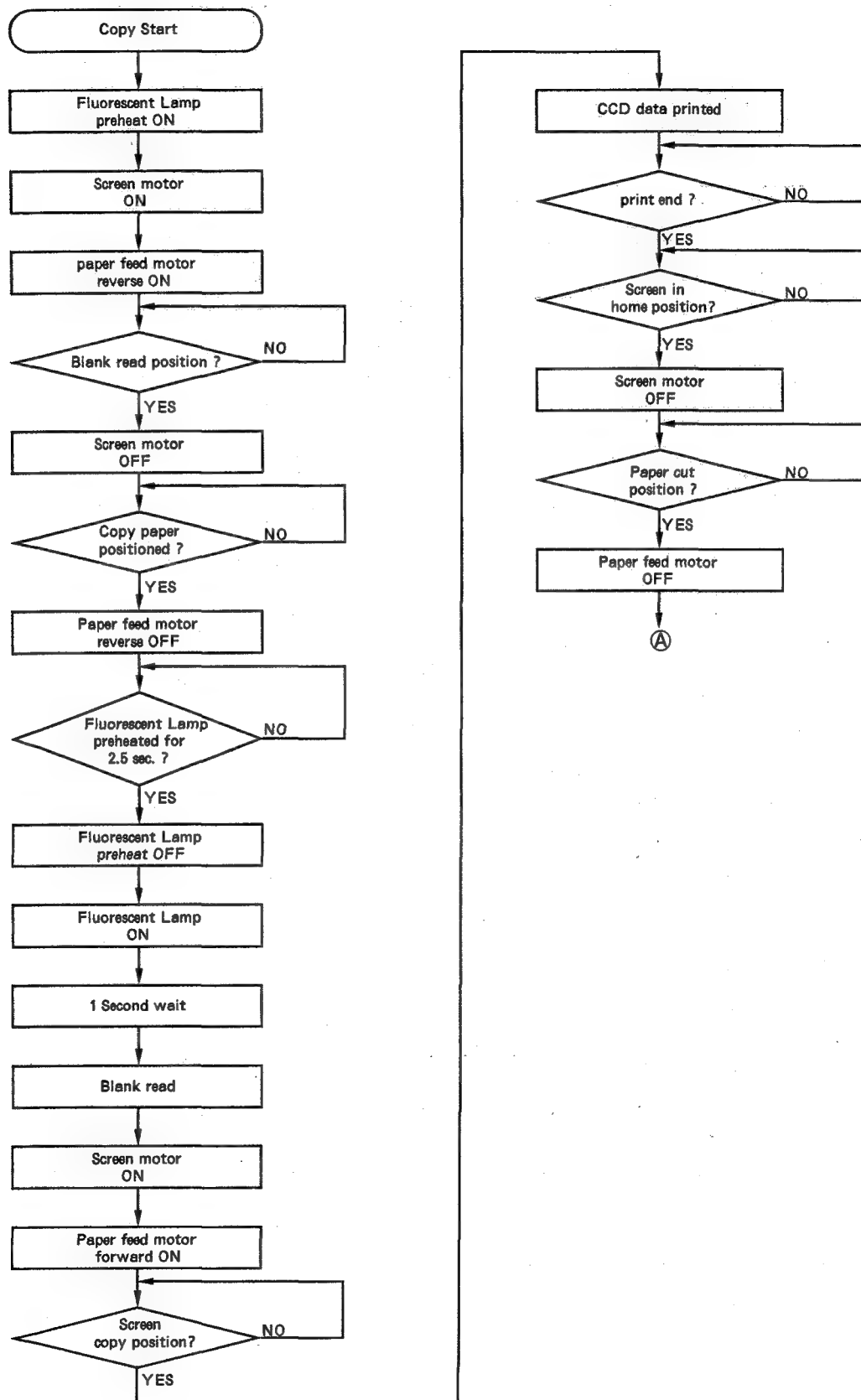


Fig. 10 Interconnection

Flowchart





2. CONTROL SECTION

2-1 CPU (IC102)

1) Specification

The KX-B620/B520 Series uses a single-chip 4 bit CMOS microcomputer.
Its specification is as follows.

- INSTRUCTION EXECUTION
TIME1 μ s min
- MEMORY ROM.....4,096 word \times 9 bit
RAM256 word \times 4 bit
- TIMER TIMER19 bit timer
TIMER2 ...8 bit timer/event counter
TIMER3 ...8 bit timer/event counter
TIMER48 bit timer
- INTERRUPT SIGNALS4 (external, timer, serial I/O timer2)
- ANALOG INPUT (Port K)4
- I/O PORT (Port D, F, G, S)27
- TIMER I/O (CNTR)1
- SERIAL I/O8 bit \times 1

2) Circuit Operation (CPU Main Function)

- ① Thermal head strobe and latch signal production
- ② Screen feed motor drive pulse production
- ③ Paper feed motor drive pulse production
- ④ Lamp drive signal production
- ⑤ LED turn on signal production
- ⑥ Key input accept
- ⑦ Start signal production to memory the WHITE waveform of the blank area of the screen.

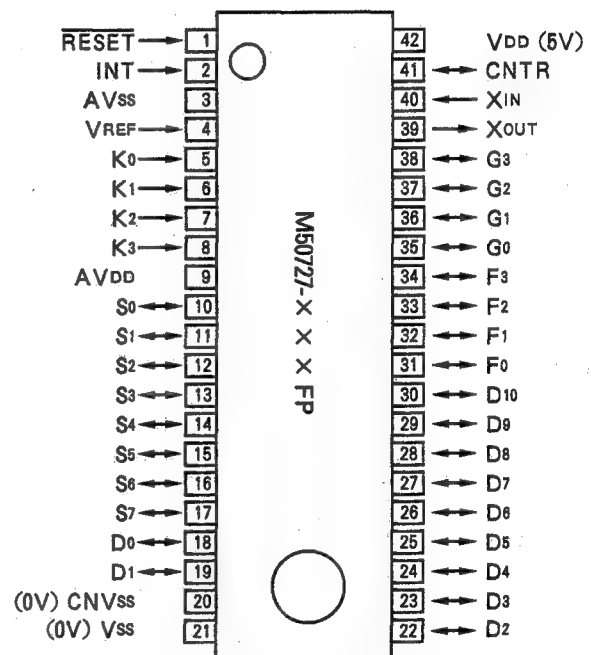
- ⑧ Signals production described below
CCO signal is made by using Timer 1, and Timer 2.

CCO signal is used by Gate Array IC103 to make line start signal INT.

It interrupts CPU, and CPU starts 1 line sequence synchronizing with this, so almost all other signals are synchronizing with this signal. ENBIM signal "H" means available interval of the signal from the analog video circuit.

PAPW signal "H" means available interval of the signal HDATA, which is fed to Thermal Head.

When PAPALL signal is "L", the clock CLKHD is stopped to feed to Thermal Head.



CPU Outward Form

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CPU pin function are as follows:

Pin no.	Terminal name	Signal	Function	input/output	Description
1	RESET	RESET	Reset signal input	in	When the reset signal is input to the CPU, the CPU resets all signals.
2	INT	INT	CCD synchronizing interrupt signal	in	When this signal is input, the CPU starts one line sequence.
3	AVSS	GROUND	CPU analog ground		GROUND
4	VREF	+5V	Analog standard power supply		Supply voltage is +5 volts.
5	K0	FEED	Screen feed signal	in	When the advance key is pressed, this signal becomes "H".
6	K1	COPY	Copy signal	in	When the copy key is pressed, this signal becomes "H".
7	K2	THERM	Temperature of the thermal head	in	Temperature of the thermal head is input.
8	K3	VPEAK	CCD peak voltage	in	CCD peak voltage is input.
9	AVDD	+5V	Analog power supply		Supply voltage is +5 volts.
10	S0	SM \bar{B}	Screen feed motor \bar{B} phase signal	out	This signal excites \bar{B} phase coil.
11	S1	SM \bar{A}	Screen feed motor \bar{A} phase signal	out	This signal excites \bar{A} phase coil.
12	S2	SMB	Screen feed motor B phase signal	out	This signal excites B phase coil.
13	S3	SMA	Screen feed motor A phase signal	out	This signal excites A phase coil.
14	S4	PM \bar{B}	Paper feed motor \bar{B} phase signal	out	This signal excites \bar{B} phase coil.
15	S5	PM \bar{A}	Paper feed motor \bar{A} phase signal	out	This signal excites \bar{A} phase coil.
16	S6	PMB	Paper feed motor B phase signal	out	This signal excites B phase coil.
17	S7	PMA	Paper feed motor A phase signal	out	This signal excites A phase coil.
18	D0	ENBIM	CCD data enable signal	out	When this signal becomes "L", CCD data is enable.
19	D1	SHSTM	Blank area start signal	out	When this signal becomes "H", IC109 stores all white waveform to the memory.
20	CNVSS	GROUND	GROUND		GROUND
21	VSS	GROUND	CPU digital ground		GROUND
22	D2	LAMPPRE	Lamp preheat signal	out	This signal preheats the lamp.
23	D3	LAMPTON	Lamp turn on signal	out	This signal turns on the lamp.
24	D4	ENDLED	Paper end LED drive signal	out	When this signal becomes "L", paper end LED lights.
25	D5	JP101	Selectable paper size	in	Jumper A4 size/Cut Letter size
26	D6		Not used		
27	D7	SHEND	Screen end signal	in	When the screen comes to home position, this signal becomes "L".
28	D8	CHGAIN	CCD gain switching signal	out	When CCD gain is insufficient, this signal becomes "H".
29	D9		Not used		
30	D10	PAEND	Paper end signal	in	When the thermal paper is exhausted, this signal becomes "H".

Pin no.	Terminal name	Signal	Function	input/output	Description
31	F0	$\overline{\text{ISTB4}}$	Thermal head strobe pulse output	out	This signal is connected to the thermal head.
32	F1	$\overline{\text{ISTB3}}$	Thermal head strobe pulse output	out	This signal is connected to the thermal head.
33	F2	$\overline{\text{ISTB2}}$	Thermal head strobe pulse output	out	This signal is connected to the thermal head.
34	F3	$\overline{\text{ISTB1}}$	Thermal head strobe pulse output	out	This signal is connected to the thermal head.
35	G0	$\overline{\text{LATCH}}$	Head data latch signal	out	When this signal becomes "L", the head data is stored in the temporary memory.
36	G1	CCO	Original rectangle pulse for all sequence	out	This signal is the original rectangle pulse for all sequence.
37	G2	PAPW	Thermal head data enable signal	out	When this signal becomes "H", the thermal head data is enabled.
38	G3	$\overline{\text{PAPALLW}}$	Thermal head clock enables signal	out	When this signal become "L", the clock to the thermal head is stopped.
39	XOUT	Not used			
40	XIN	XIN	External clock input	in	This clock frequency is 4 MHz.
41	CNTR	+5V	Not used		+5V pull up.
42	VDD	+5V	Power supply		Supply voltage is +5 volts.

Timings of Signals from CPU are as follows:

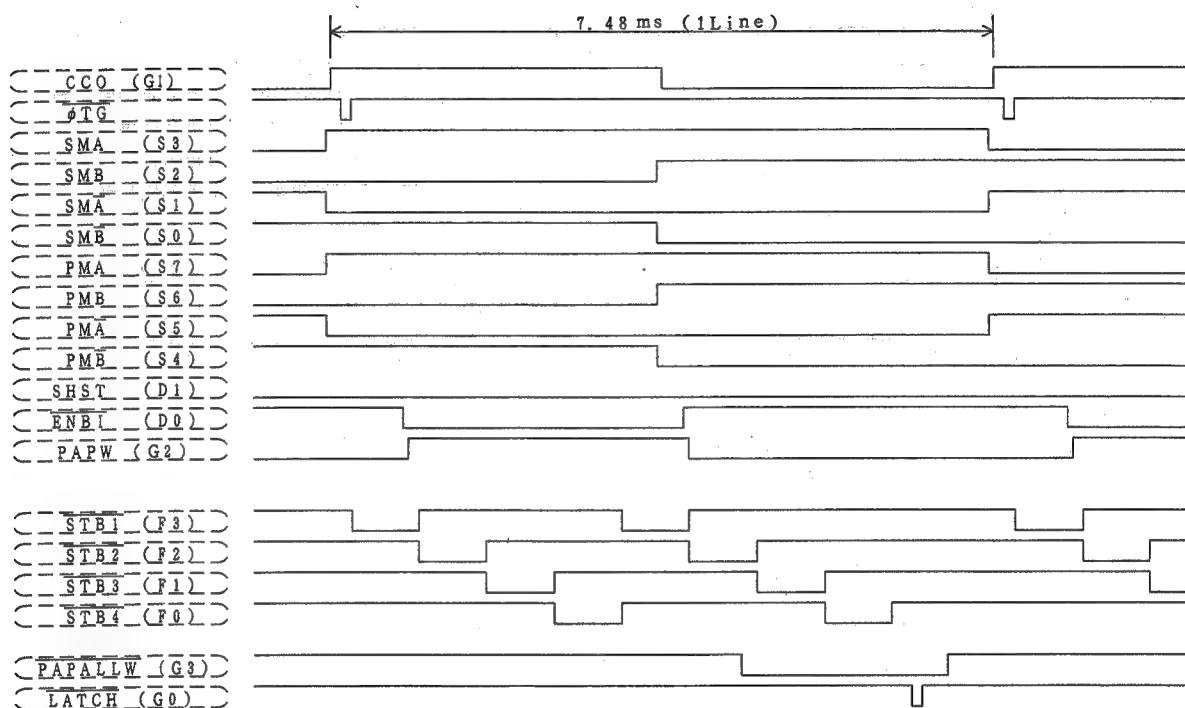


Fig. 11 TIMING CHART of Signals from CPU

2.2 Reset Signal Circuit

1) Function

When the power is turned on, or when the power is momentarily interrupted, reset pulses are generated to reset the CPU.

2) Circuit Operation

When the power is turned on and the power source V_{CC} increases to exceed +4.25 V, Reset IC (IC101) is activated, "L" signal is sent for about 3.3 ms and "H" is sent to reset the CPU (5-pin).

When the power is momentarily interrupted and power source goes down below +4.25 V, "L" signal is sent to stop the CPU. When the power is resumed and power source increases to exceed +4.25 V, "L" signal is sent for about 3.3 ms and "H" is sent to reset the CPU again.

Circuit diagram and timings are as follows:

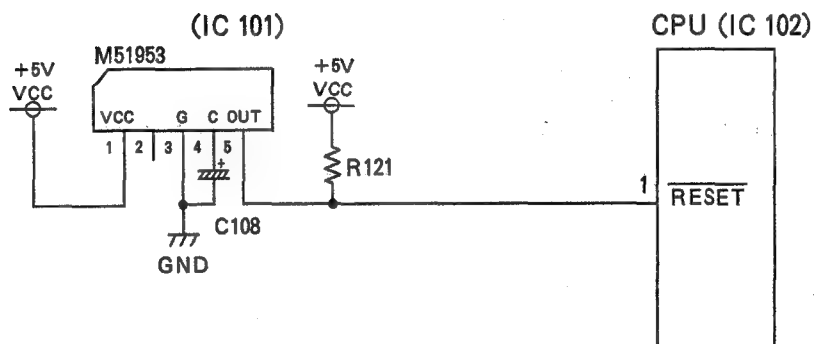
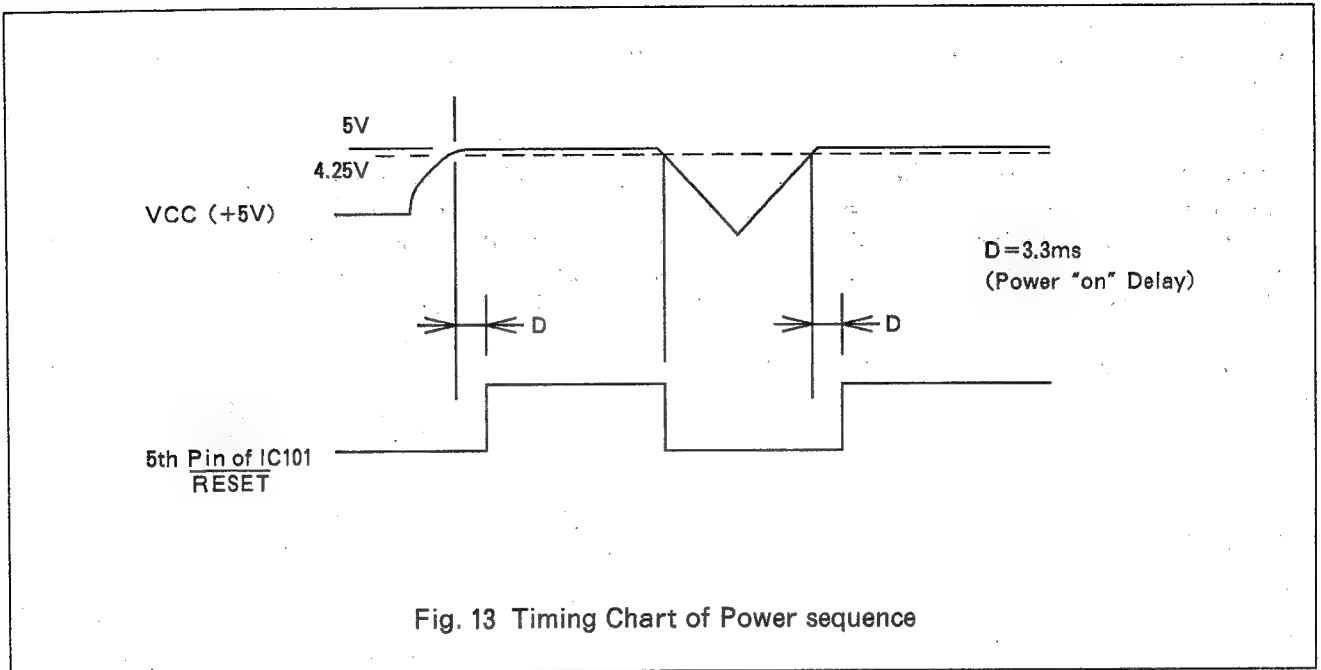


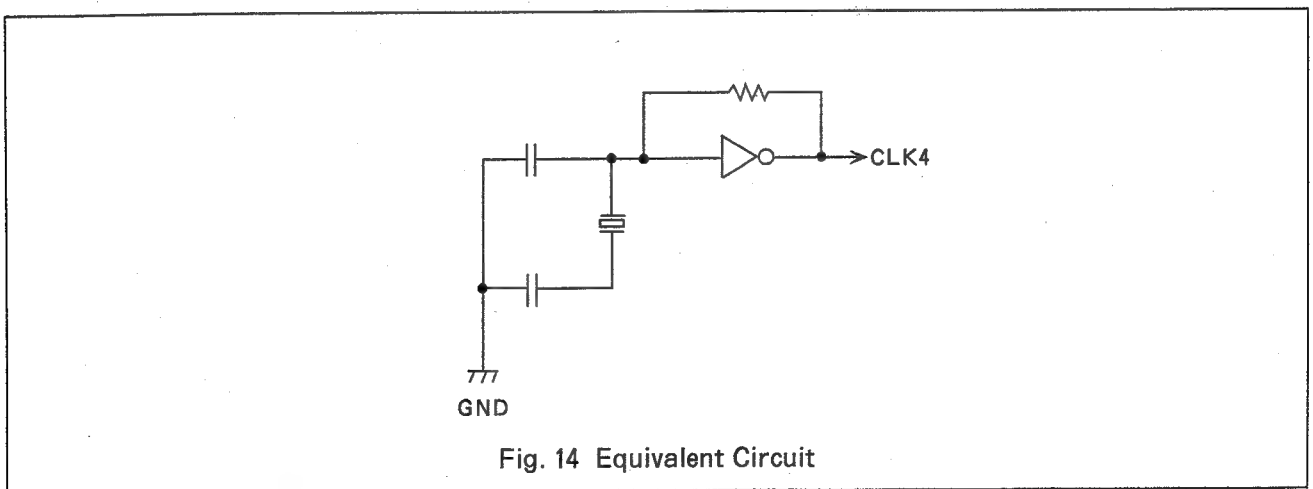
Fig. 12 Circuit Diagram

Timing chart is as follows:



2-3 Gate Array (IC103)

- 1) Function
 This gate array is divided into five section expediently.
 Equivalent circuit of this gate array is Fig 15.
- 2) Circuit Operation
 - ① Oscillator section
 The 4 MHz clock is produced and supplied to CPU and internal clock generation circuit.



- ② Interrupt Signal (INT) generation section
 This signal is a start signal of 1 line sequence.
 It is made from CCO software produced signal from CPU.
 It is sampled by 250 kHz clock and synchronized with hardware timing. It interrupts CPU and makes it start 1 line sequence. For example, the thermal head strobe signals and latch signal are produced.

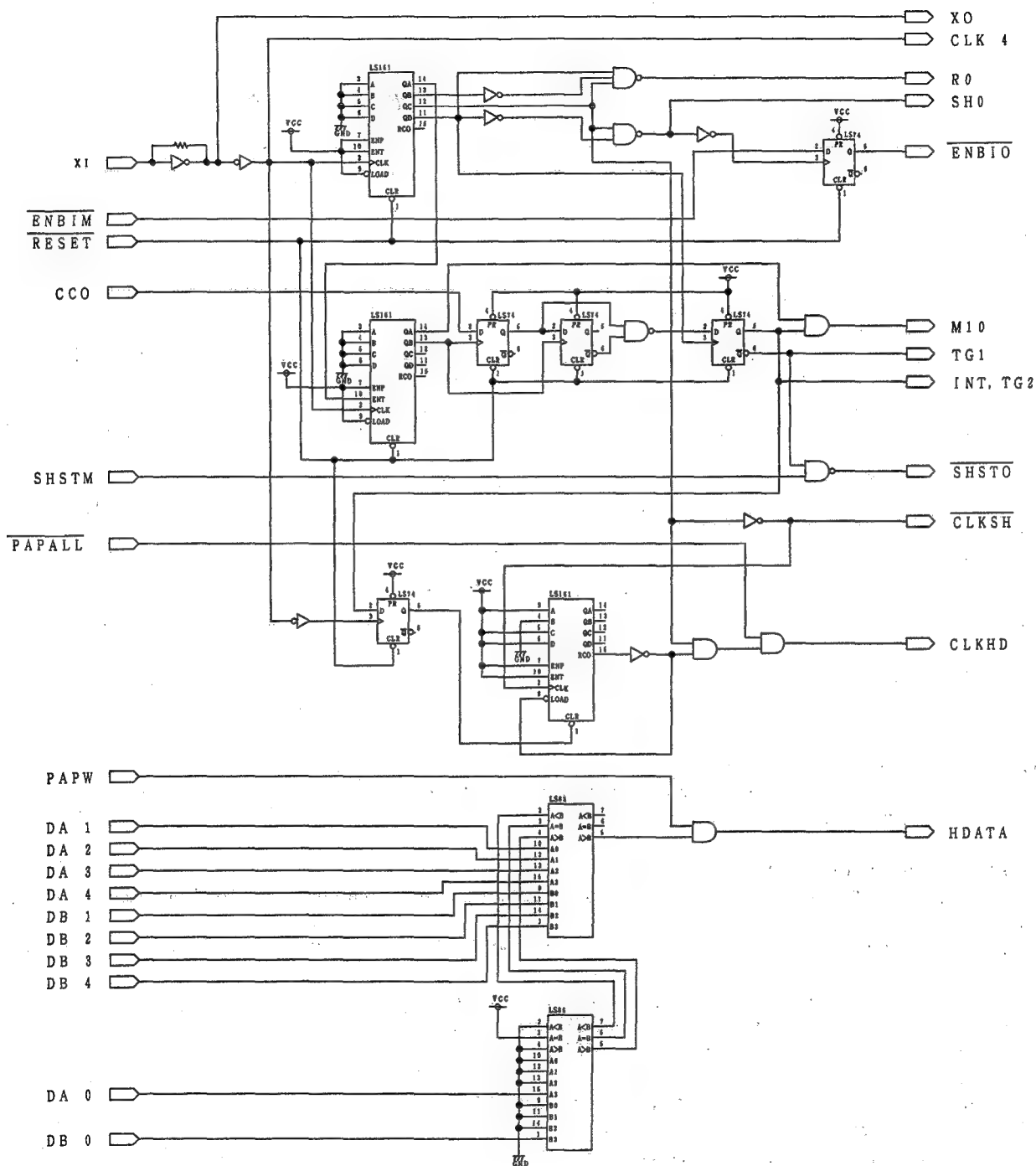


Fig. 15 Equivalent Circuit

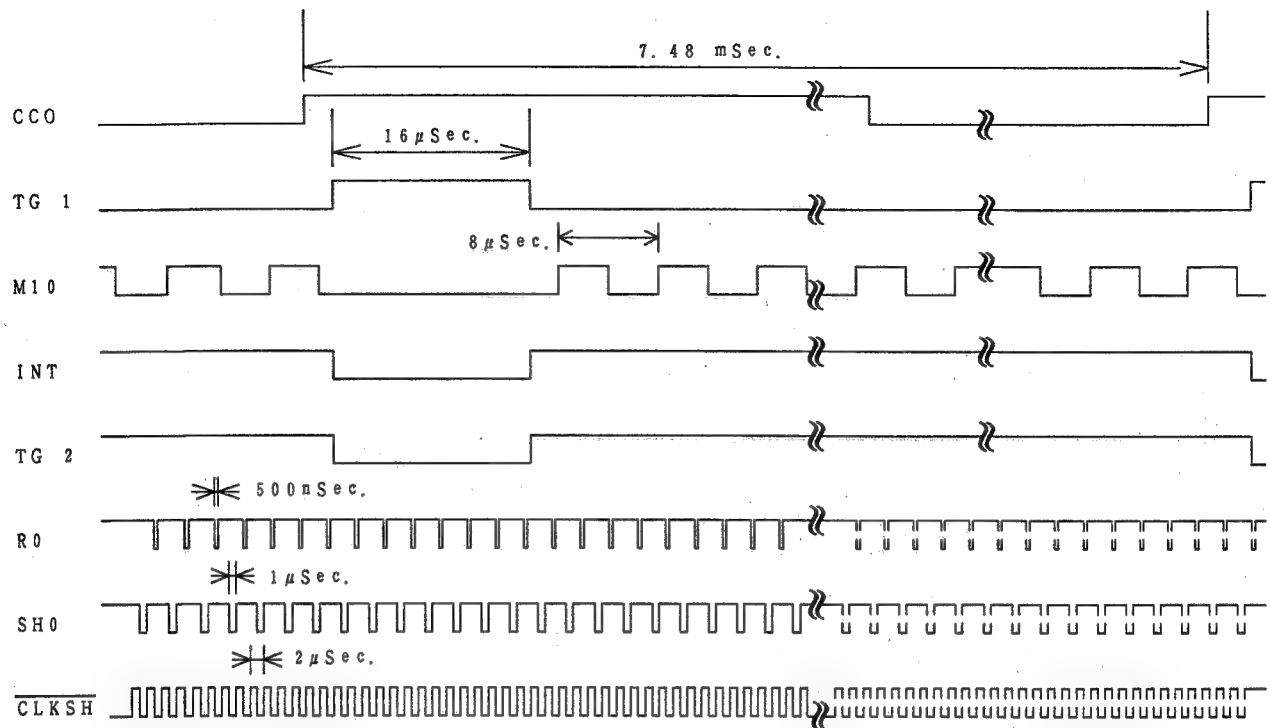


Fig. 16 Timing Chart

- ③ CCD clock generation section
 CCD clocks R0, SH0, M10 and TG2 are generated in this section.
 Timing chart is shown above.
- ④ Thermal Head clock generation section
 The number of CCD elements are 1,024 dots, and the number of elements of Thermal Head are 1,728 dots.
 The binary converted signal from the CCD is zoomed $4/3$ times, and white data for the filing space is inserted.
 This is accomplished sample the original signal by $4/3$ times the frequency clock (CLKHD) .
 CLKSH is two times the frequency of the CCD clock.
 CLKH is thinned out in $2/3$ rate from CLKSH.

 The number for CLKH is $4/3$ times compared with CCD clock.
 Then CLKH is gated by PAPALLW signal.
 White data is added moderately as a result.

The LATCH signal is produced by the CPU, and fed to the Thermal Head directly.

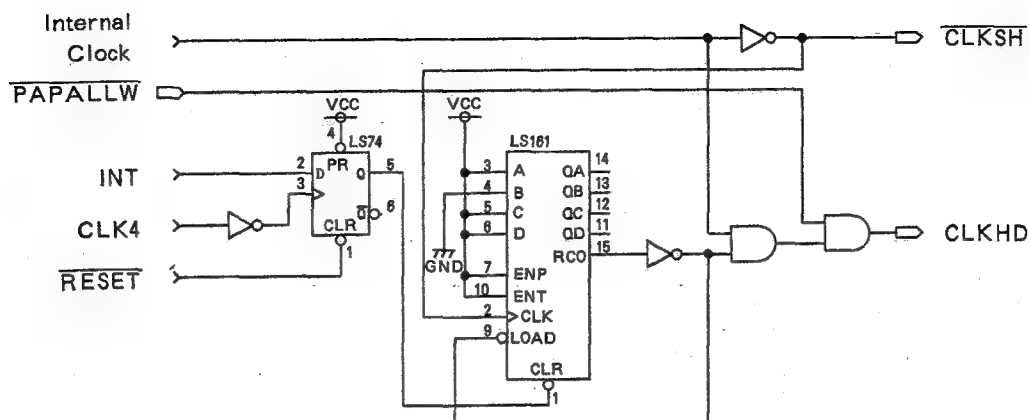


Fig. 17 Equivalent Circuit

⑤ Binary Converting section

The gray level signal (DB0—DB4) from the shading correcting and A/D convert LSI (IC109) is binary converted by the magnitude comparator.

Its signal is gated by PAPW signal.

As a result HDATA is an available signal in the CCD video signal.

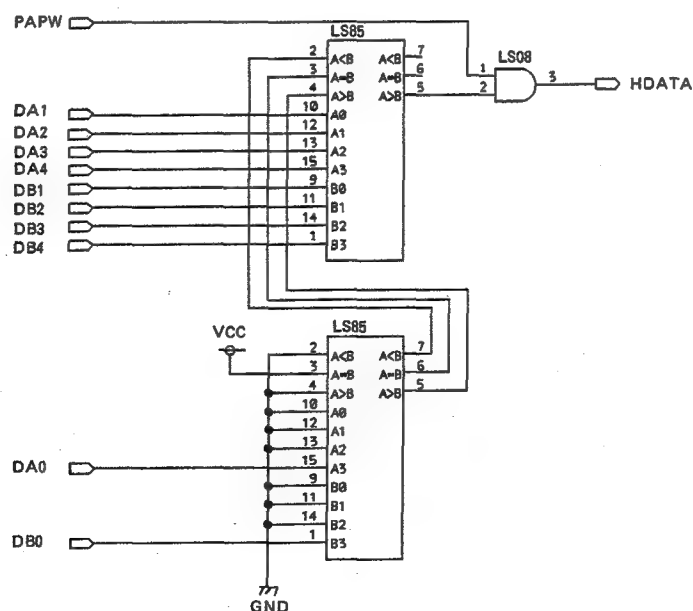
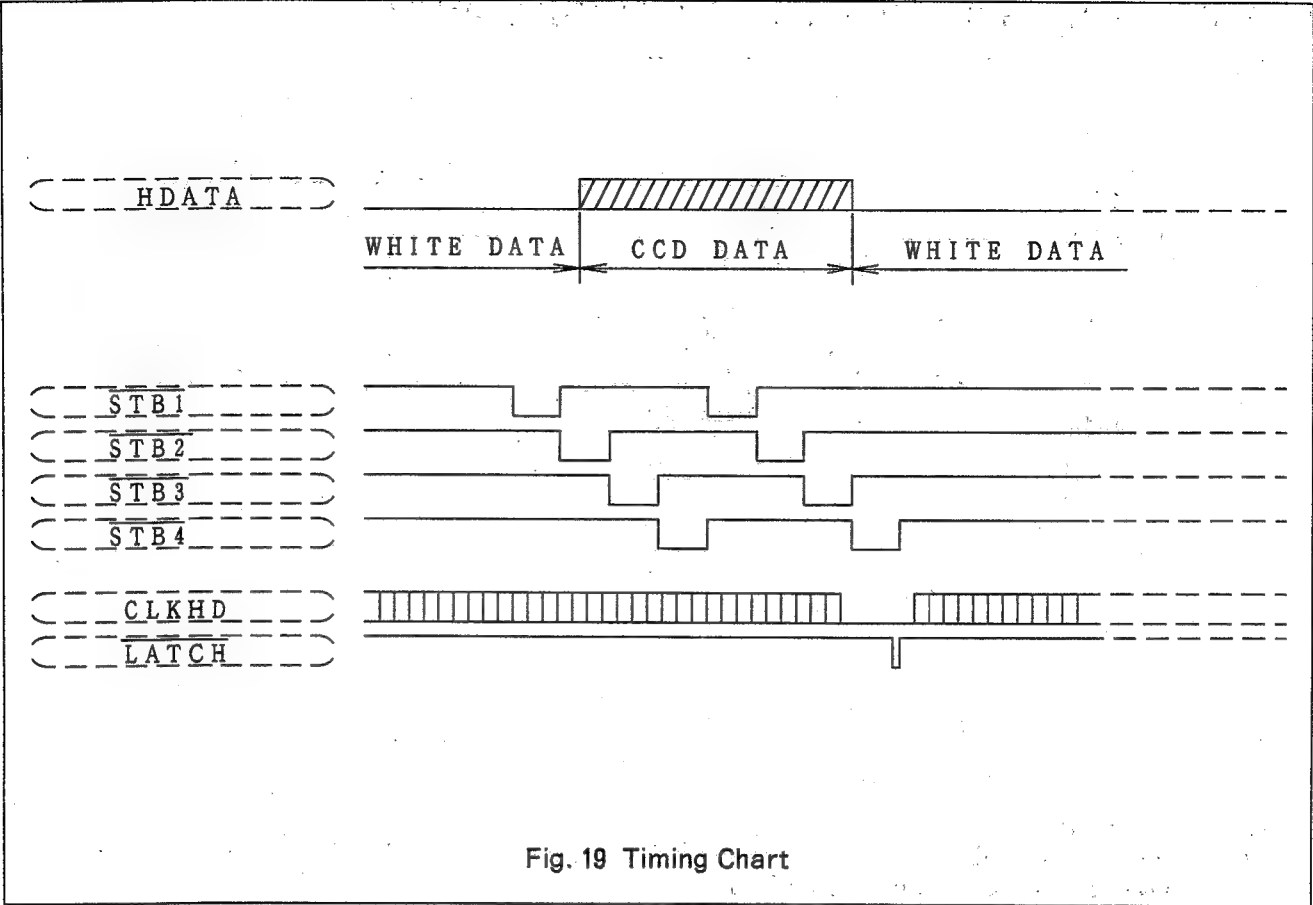


Fig. 18 Equivalent Circuit



2-4 Stepping Motor Drive Circuit

- 1) Function
Two stepping motors are used for screen feed and paper feed.
- 2) Circuit Operation
Stepping pulses are output from CPU, causing drivers IC104, IC105 to go ON.
It makes a 1-step rotation.
Circuit Diagram and Timing Chart are shown below.

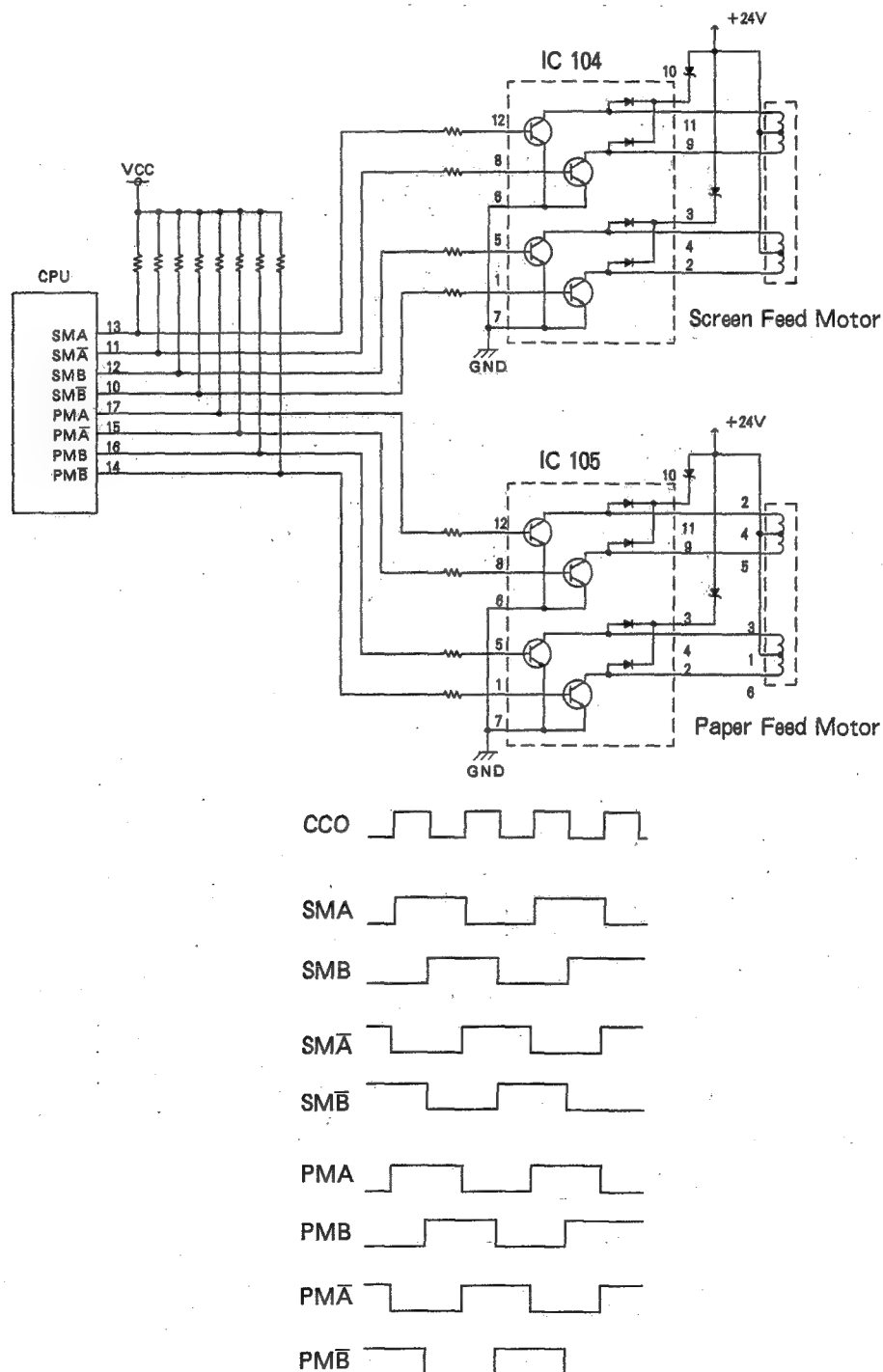


Fig. 20 Circuit Diagram and Timing Chart

2-5 Shading Correcting Circuit

1) Function

In this circuit video signal distortion called shading which is caused by the difference of the sensitivity of each photo sensor in CCD and the optical system distortion is compensated. This is accomplished by the LSI (IC109) and the memory (IC110) .

2) Circuit Operation

Circuit Diagram and the Block Diagram of LSI (IC109) are shown below.

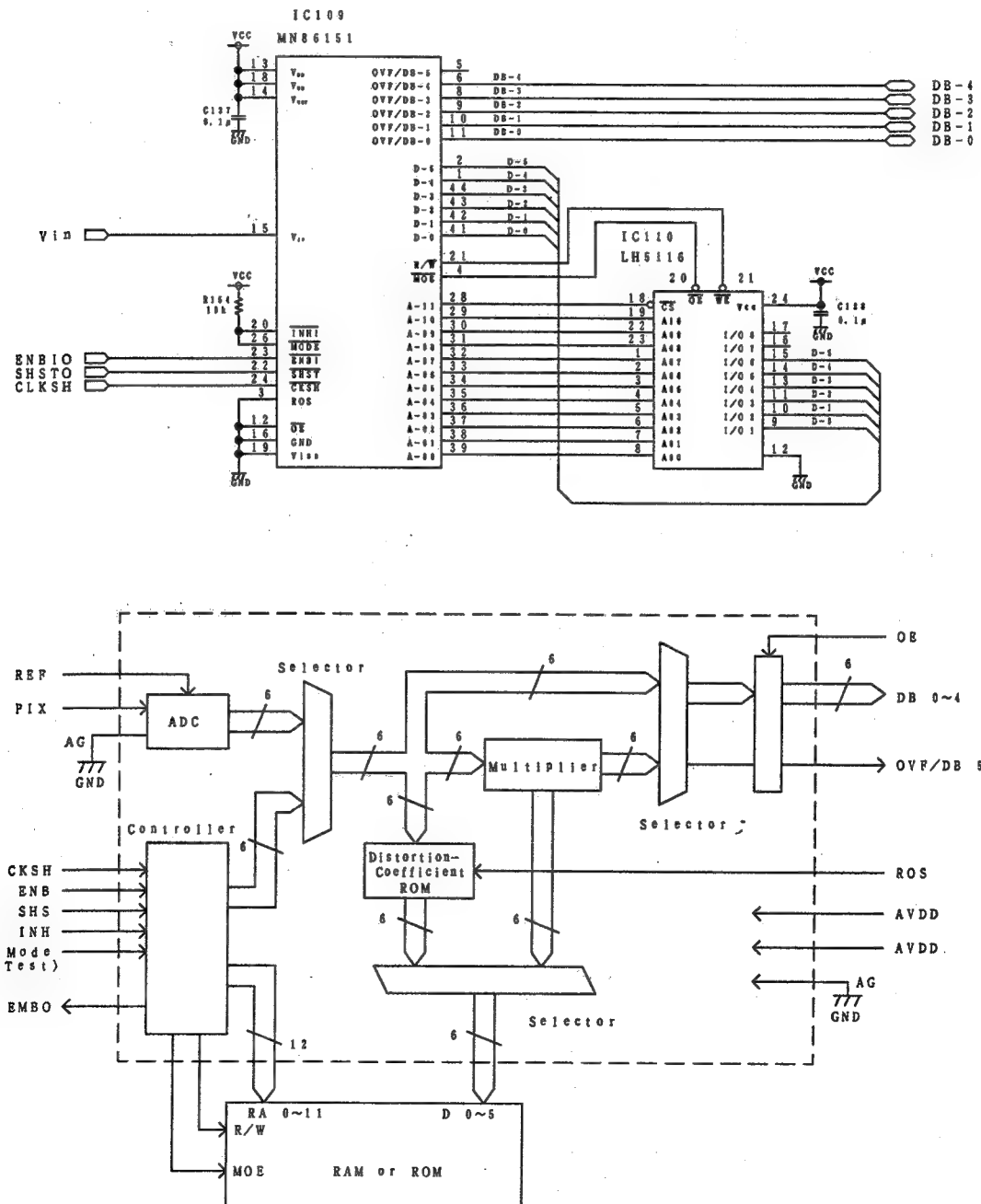


Fig. 21 Circuit Diagram and Block Diagram of IC109

① Explanation of the block diagram of LSI MN86151

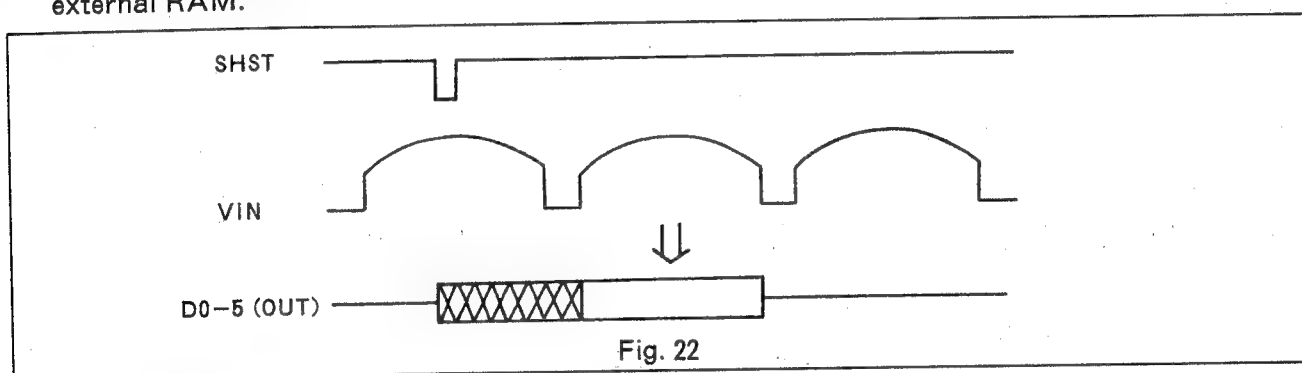
This LSI is composed of four blocks, the ADC section, ROM section, MUL section and CTL section. Each section's operation is as follows:

- ADC (Analog to Digital Converter) section
 The pix signal (the video signal from the analog circuit) is compared with the REF signal (+5V), and converted to digital 6 bit signal.
- ROM (Mapping Read Only Memory) section
 The distortion coefficient data is mapped to the external RAM by this mapping ROM. The Output of ADC section is used for the address of this ROM.
- MUL (Multiplier) section
 This section is a multiplier of 6×6 bit.
- CTL (Control) section
 The functions of this section are control of shading correcting, control of ADC, and interface to external RAM.

② Operation of LSI

(Step 1) Blank (white area) reading

The video signal of the blank (white area) is inputted in VIN pin, and "L" pulse is fed in SHST pin, which causes this LSI to memory the distortion coefficient 6 bit data for each pixel to the external RAM.



The coefficient data is induced from the following formula.

D_K: distortion coefficient data ($\phi - 63_{10}$)

D_w: base data of white ($\phi - 63_{10}$)

$D_w = \text{Int.} [(V_w / 5) \times 64 + 0.5]$

V_w: video signal voltage of white area (0–5V)

a) 50% compensative Mode (not used)

$D_K = \text{Int.} (2,048 / D_w)$

(If V_w is below 2.5V, D_K is fixed to 63.)

b) 75% compensative Mode

$D_K = \text{Int.} (1,024 / D_w)$

(If V_w is below 1.25V, D_K is fixed to 63.)

(Step 2) Compensation

"H" level of SHST is inputted and video signal of the document area on the screen is inputted from VIN pin.

This LSI calculates the compensated output data of each pixel from the video signal and the distortion coefficient data of the external RAM.

The data is induced from the following formula.

D_B: compensated output data ($\phi - 31_{10}$)

D_K: distortion coefficient data ($\phi - 63_{10}$)

D_p: document signal data ($\phi - 63_{10}$)

$D_p = \text{Int.} [(V_p / 5) \times 64 + 0.5]$

V_p: video signal voltage document area (0–5V)

a) 50% compensative mode (not used)

$D_B = \text{Int.} (D_p \times D_K / 64)$

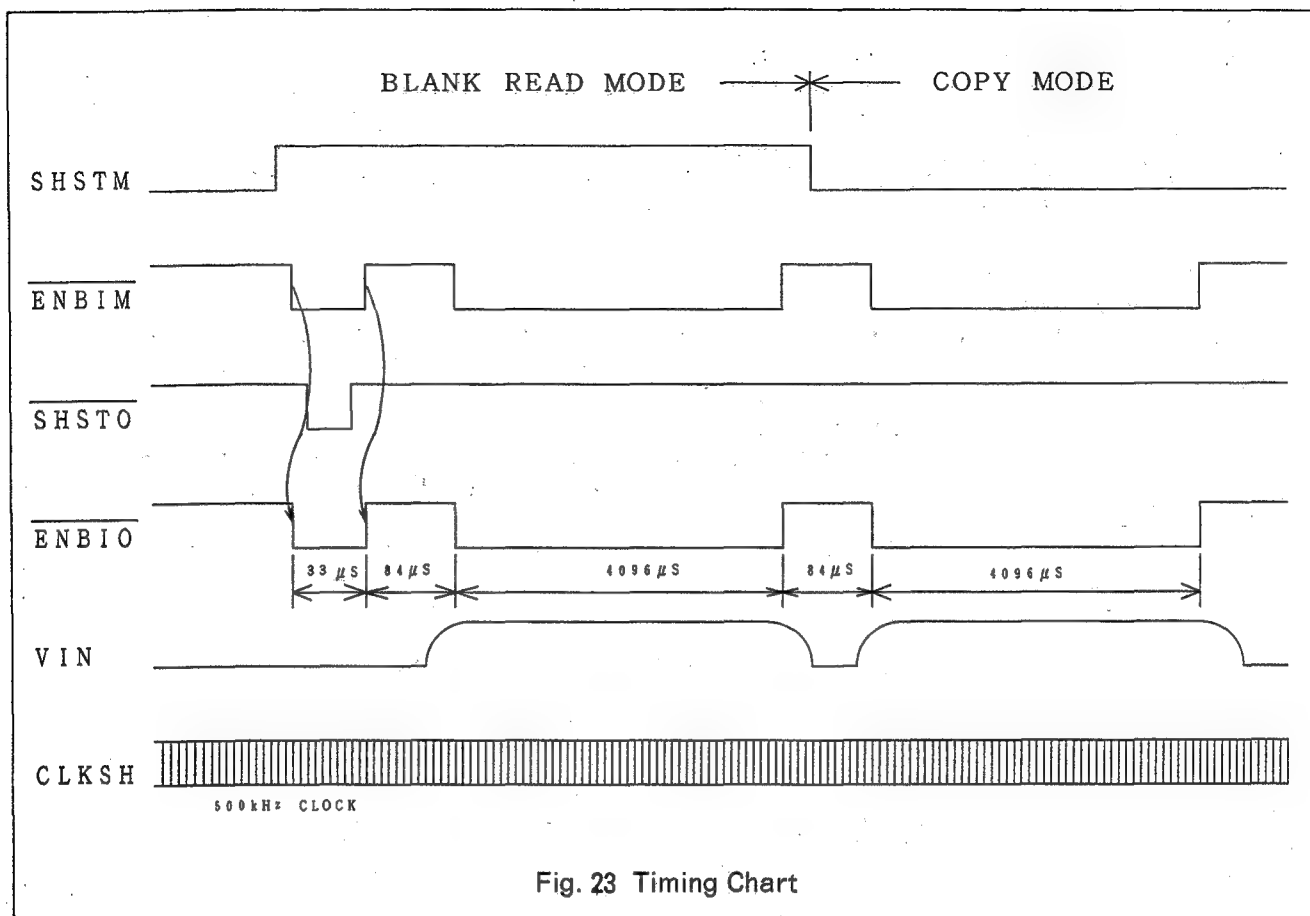
b) 75% compensative mode

$D_B = \text{Int.} (D_p \times D_K / 32)$

If $D_B \geq 32$, then $D_B = 31_{10}$ and OVF = 'H'

If $D_B < 32$, then $D_B = D_B$ and OVF = 'L'

③ Timing chart of signals.



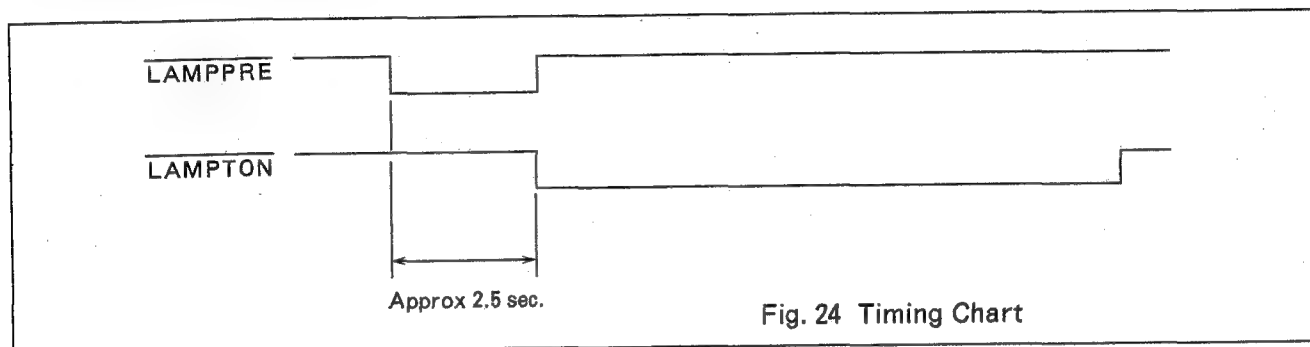
ENBIN signal and SHSTM signal are made by the CPU, and synchronized with the CCD signals by Gate Array (IC103) .

As a result, SHSTO signal and ENBIO signal are made and fed to LSI (IC109) .

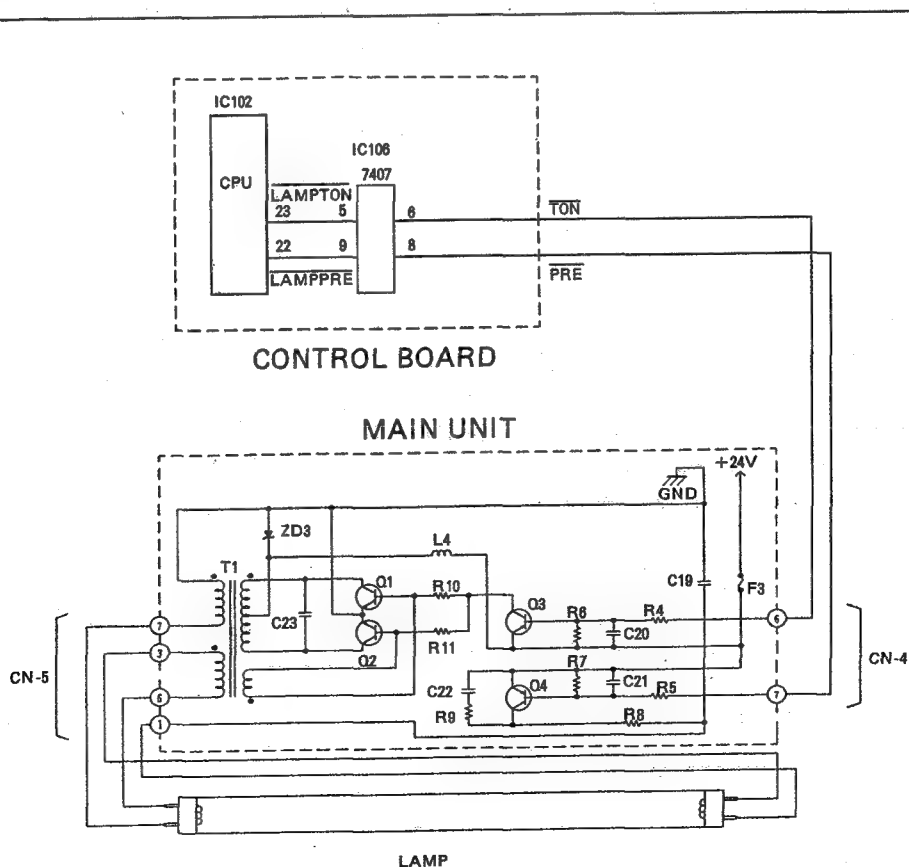
When the ENBIO signal is "L", the LSI converts input video signal into digital 6 bit signal.

2-6 Lamp Drive Circuit

- 1) Function
Lamp drive circuit is on the power supply board.
Control signals for Lamp drive circuit are supplied from CPU.
Lamp driver lights the fluorescent lamp at high frequency to prevent flickering.
It also preheats the filament just before turning it on to reduce blackening. (increase its life)
- 2) Circuit Operation
CPU makes two signals, LAMPPRE and LAMPTON.
Timing is shown below.



Transistor Q4 in the Lamp Driver turns on by the LAMPPRE signal, so preheat current flows through the Lamp filaments.
Then self oscillating circuit composed of Q1, Q2, T1, C23 and L4, start oscillating at about 47 kHz by the LAMPTON signal.
It supplies AC110V, 47 kHz power source to the Lamp, so the Lamp turns on.



2-7 Video Signal Level Shift Circuit

1) Function

This analog circuit converts the video signal from the CCD board to the appropriate DC level and gain signal for the IC 109.

2) Circuit Operation

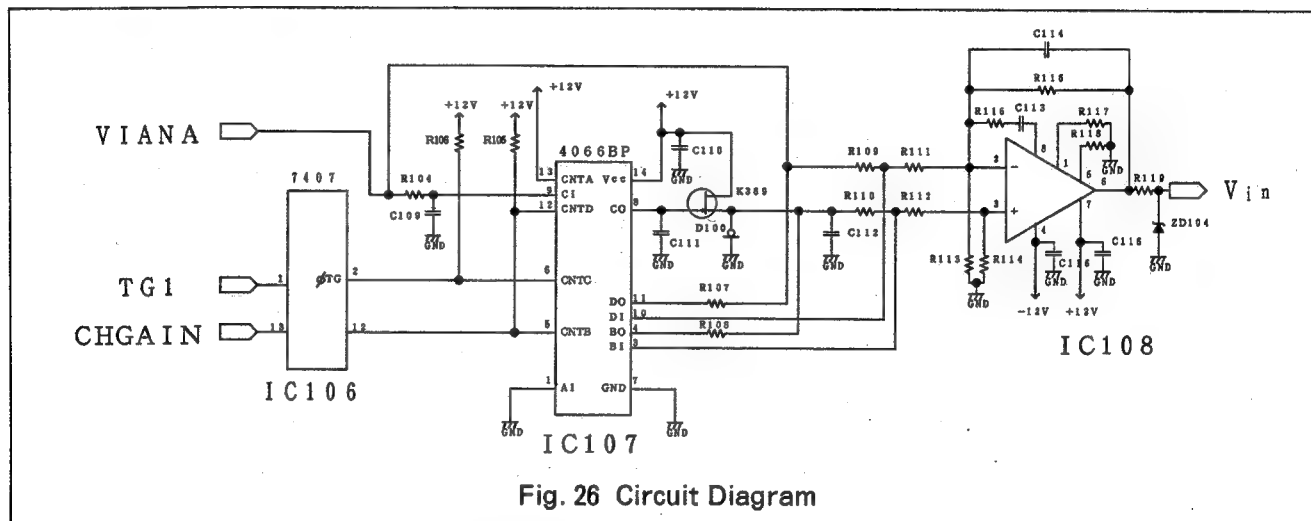


Fig. 26 Circuit Diagram

The digital conversion LSI (IC109 "MN86151") inputs must be as follows:

Black Level = 0V

White Level = 5V

Because of the necessity of the conditions it is necessary to shift the DC level of the signal as shown below.

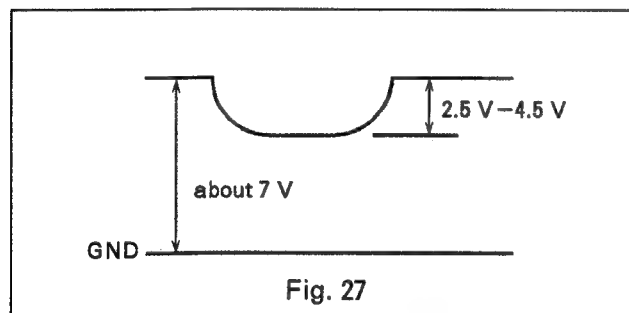


Fig. 27

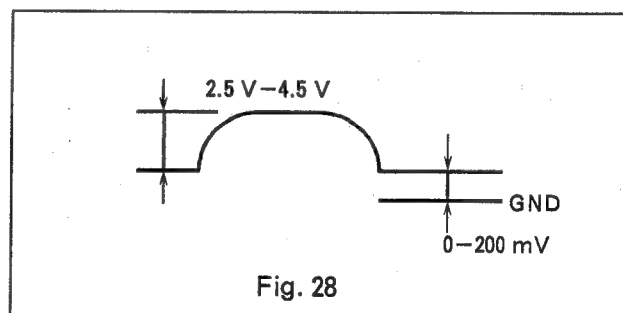


Fig. 28

Black level of the signal from the CCD board is about 7V as shown above.

Its level is sampled and held by the analog switch IC107 and condenser C111 at the timing of ϕ TG. Signal level of TG1 and ϕ TG is shown below.

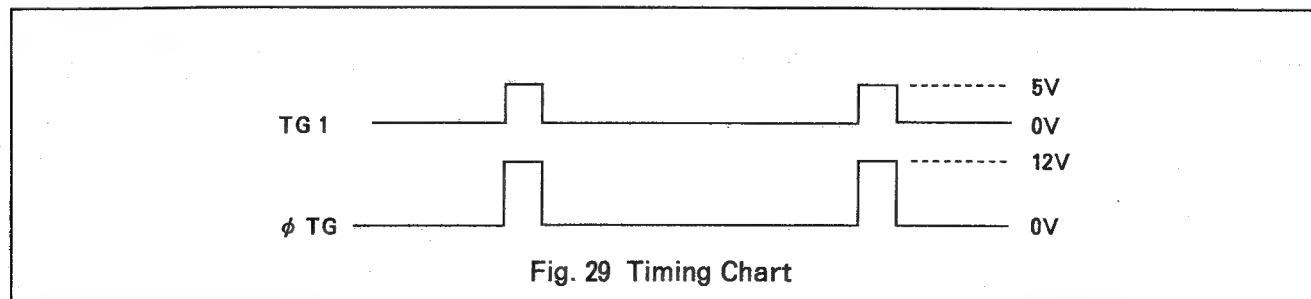


Fig. 29 Timing Chart

This black level is subtracted from the original video signal, and still more the video signal is inverted. This is accomplished by the differential amplifier IC108.

2-8 Thermal Head

1) Function

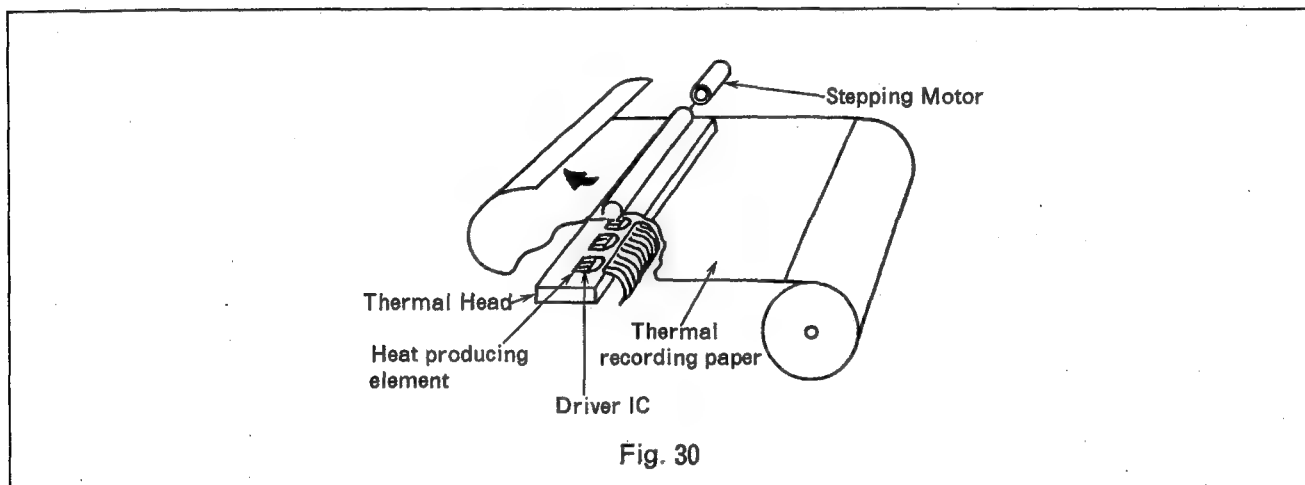
This unit utilizes state of the art thermal printer technology.

In this format, the recording paper (roll paper) is chemically treated and heat sensitive.

When the thermal head contacts this paper, the "Black" signal comes from the forwarding side, the thermal head emits heat momentarily and black dots (appearing almost as a point) are printed on the paper.

If this point is continued, letters and/or diagrams appear.

Composition of Printer Section

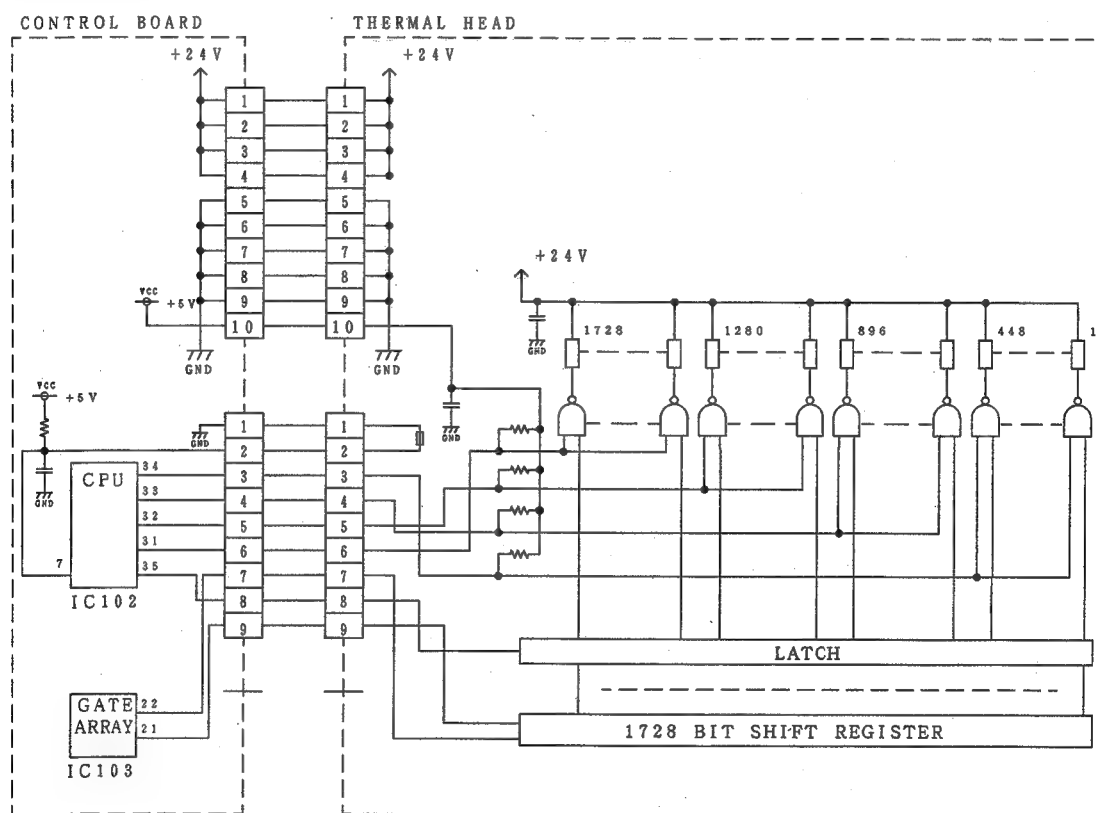


2) Circuit Operation

There are 27 driver ICs aligned horizontally on the thermal head and each one of these ICs can drive 64 heat emitting resistors.

This means that one line is at a density of $64 \times 27 = 1,728$ dots = (8 dots/mm).

White / Black (white = 0, black = 1) data in one line increments is synchronized at IC103 pin 22 (CLKHD) and sent from IC103 pin 21 (HDATA) to the shift register. The shift registers of the 27 ICs are connected in series, and upon shift of 1,728 dots increment, all the shift registers become filled with data, and a latch pulse is emitted to each IC from IC102 pin 35 (LATCH). With this latch pulse all the contents of shift registers are latched to the latch registers. Thereafter, through the addition of a strobe from IC103 only the dot location for black (= 1) among latched data activates driver, and current passes to heat emitting body to cause heat emission. Here the strobe of STB1 to STB4 impresses 0.84 or 0.91 msec each, two times for one line printout. The sequence is as shown below.



Equivalent Circuit

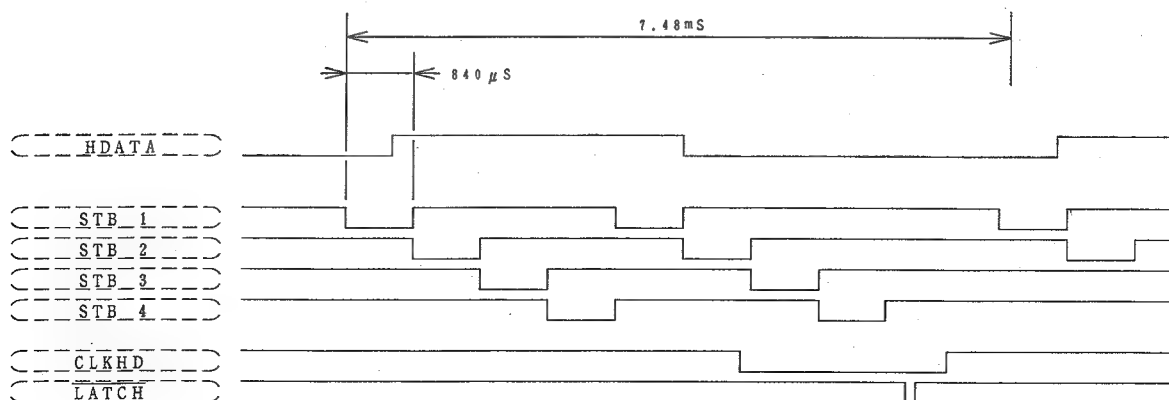


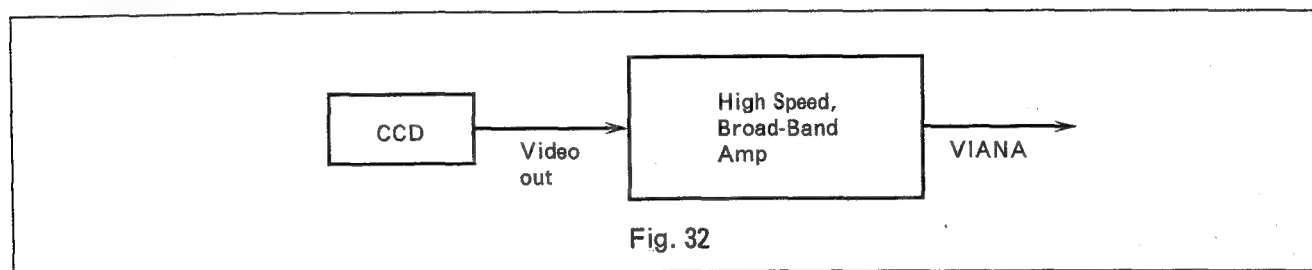
Fig. 31 Timing Chart

2-9 CCD Sensor Board

1) Function

This block is made up of the CCD sensor "UPD3575" (IC201) which has a sampling circuit inside, and broad - band amp "NJM318D" (IC202). The main operation of the amp is amplifying the signal from CCD.

Block diagram



The fluorescent light illuminates the image on the screen, its image is reflected in a mirror, and input into the CCD. The output from the CCD is in proportion to the amount of light.

2) Circuit Operation

① CCD section

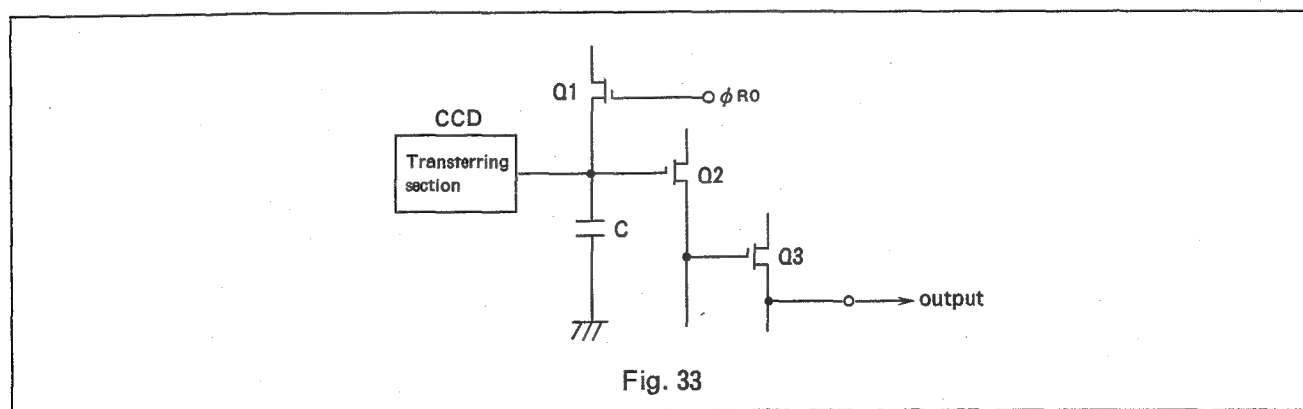
A CCD (Charge Coupled Device) is composed of the 1,024 bit linear image sensor. It converts the optical data to electrical data. The driving of CCD needs four kinds of clocks which are ϕ_{RO} , ϕ_{SH0} , ϕ_{10} and ϕ_{TG} . It is possible for CCD to drive in TTL.

Clock is inputted from the main control P.C.B. to the CCD P.C.B. through CN6.

Each Clock Description

ϕ_{RO} : Reset gate clock signal

Buffer amplifier is as follows:



KX-B620 Series KX-B520 Series

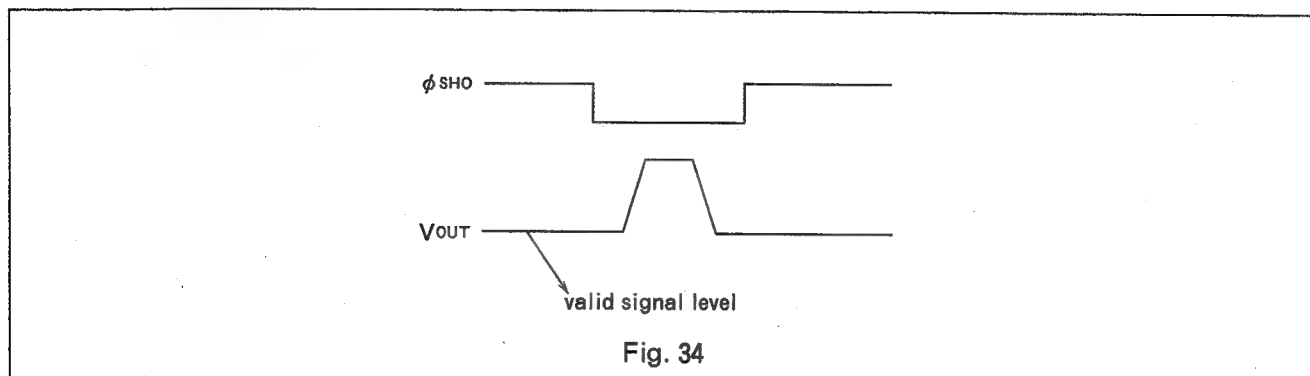
Capacitor C receives the transferred electric charge.

The voltage difference is outputted from source follower of Q2 and Q3. Q1 recovers the quantity of charge in capacitor C to the constant quantity.

ϕ_{SHO} : Sample and hold clock signal

This samples the continuous signal from CCD.

The timing of V_{out} is as follows:



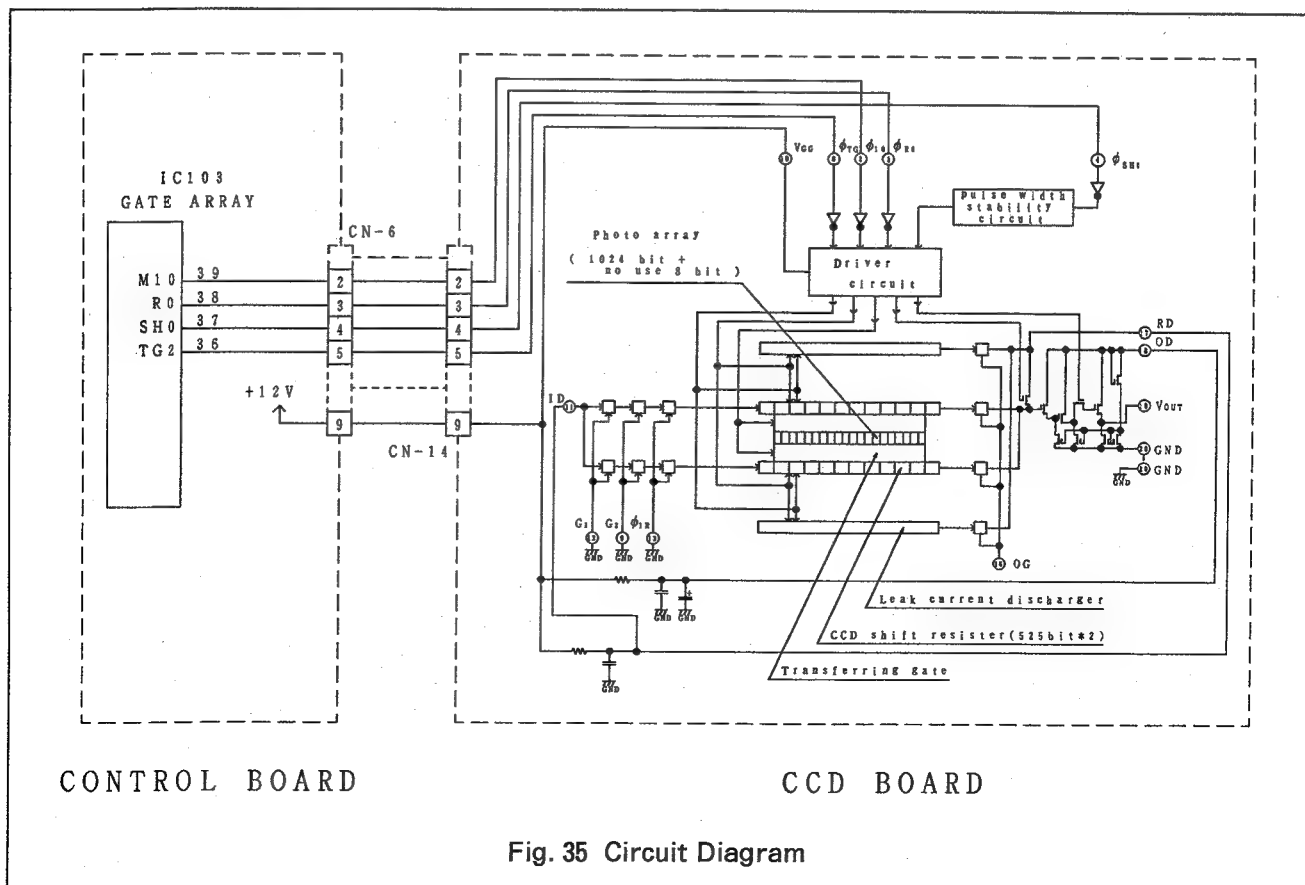
ϕ_{10} : Shift register clock signal

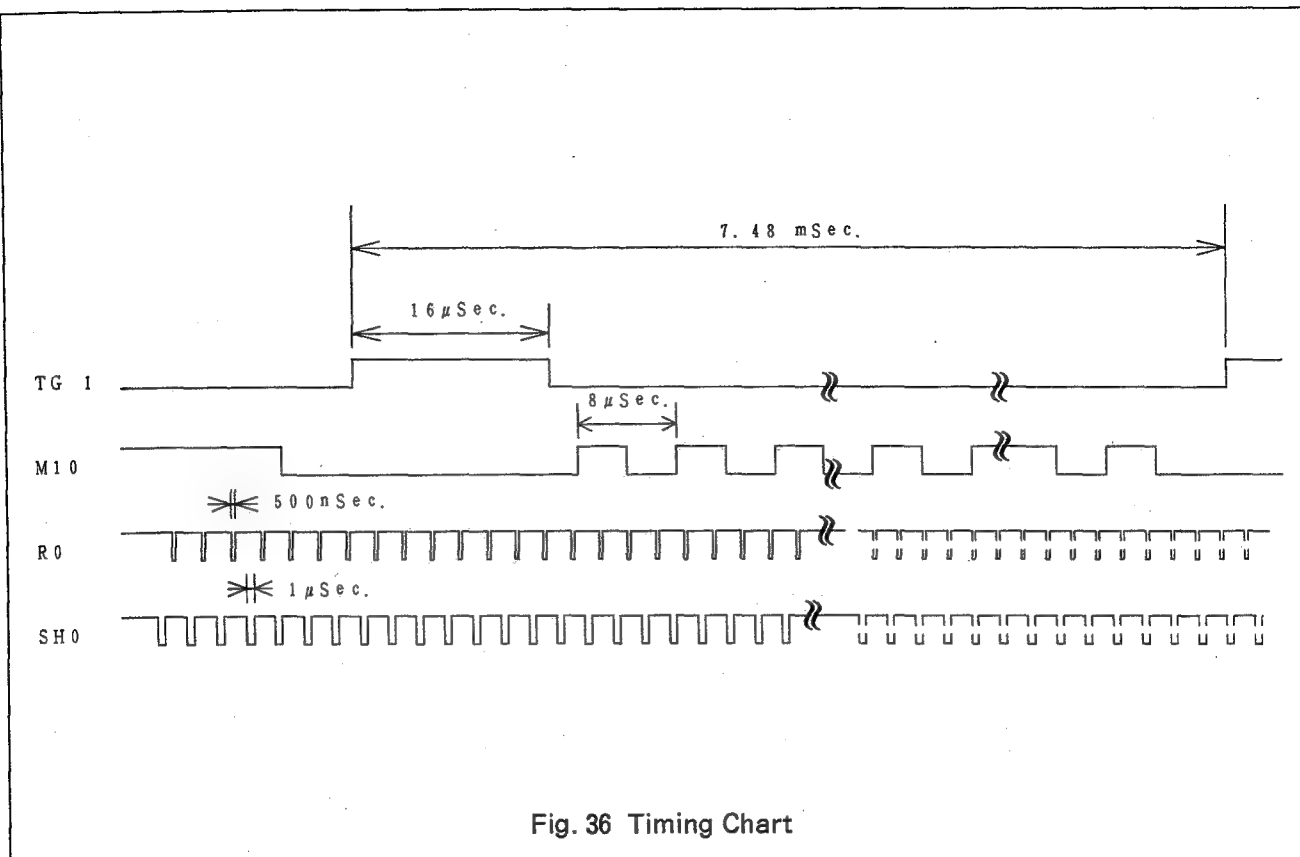
This clock signal separately shifts the transferred data in the shift register which has two lines of 525 bit.

The shifted data is sampled and held in ϕ_{SHO} , and output as V_{out} .

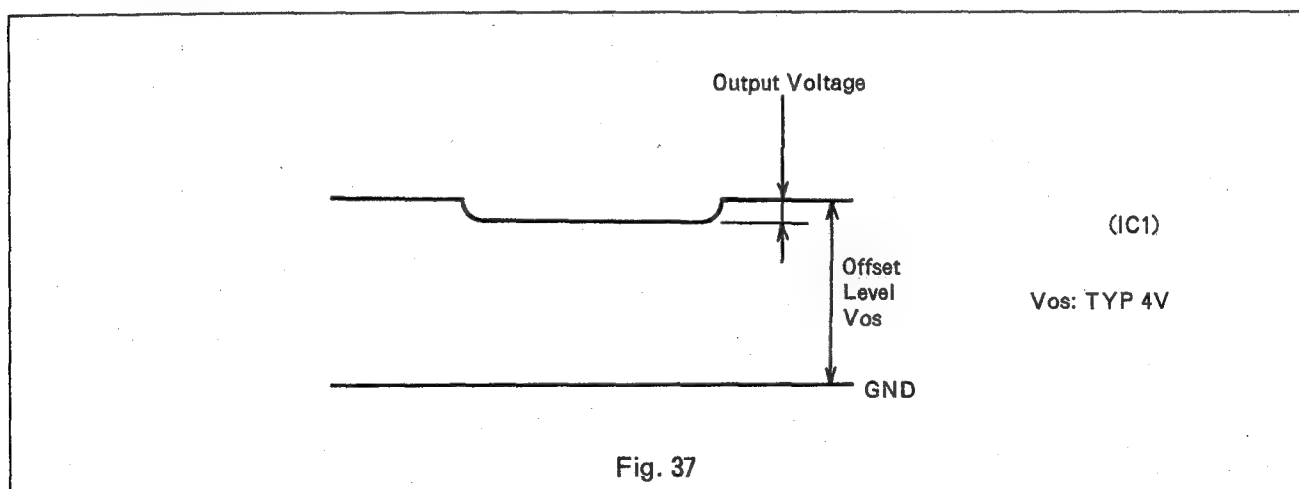
ϕ_{TG} : Transferring gate clock signal

This clock signal transfers the charge in light conversion section to the shift register. The charge in the odd element is transferred to the odd shift register. The charge in the even element is transferred to the even element. One period of transferring gate clock equals the charging time of the CCD.





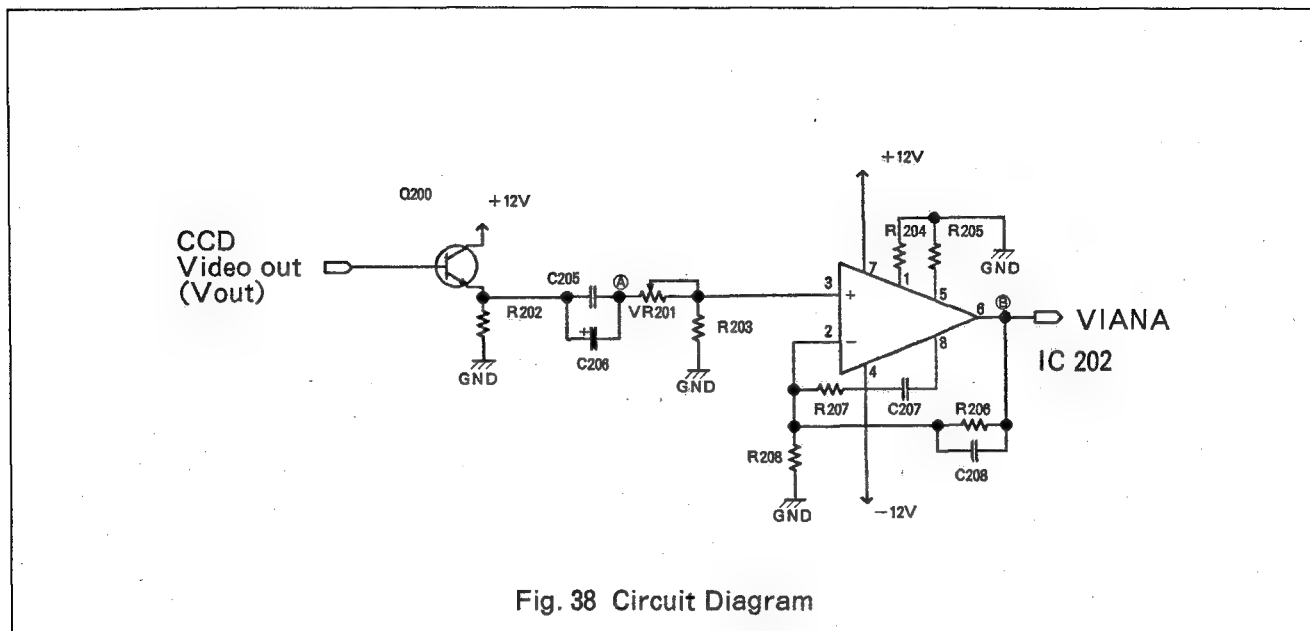
- ② Amp section
CCD output signal is shown below.



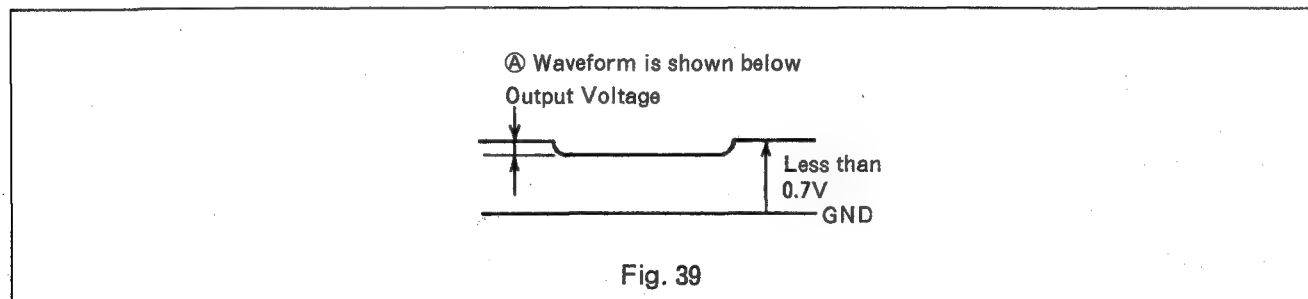
KX-B620 Series KX-B520 Series

DC level is TYP 4V, so if amplified directly, it becomes very distorted. Therefore the input for the broad-band amp is a condenser coupling circuit.

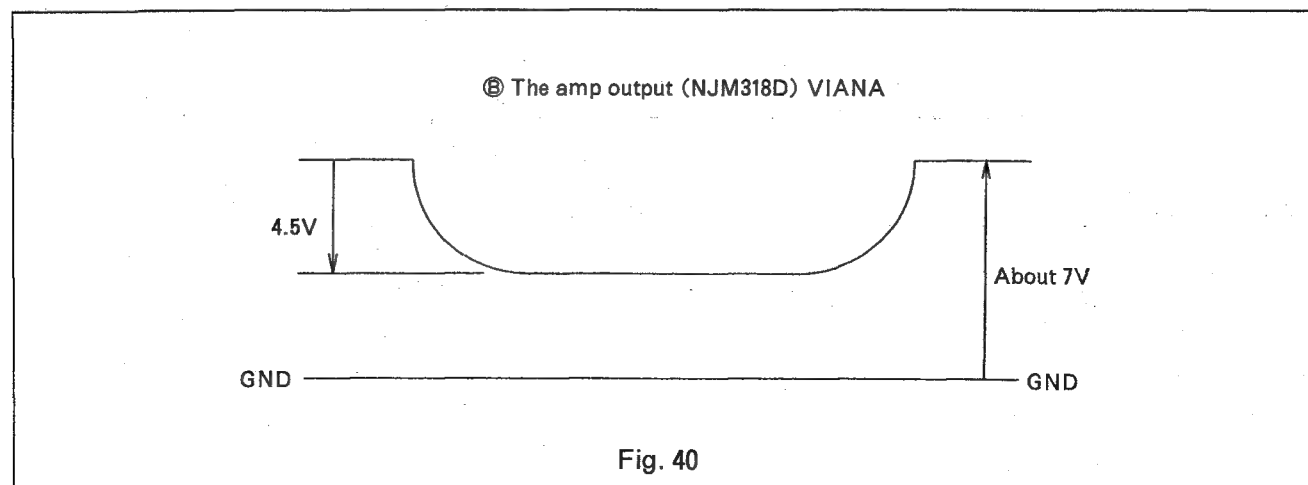
The output signal that is cut by condenser coupling circuit is amplified by IC202 (NJM318D), Gain is adjustable by VR201.



Ⓐ Waveform is shown below.



Ⓑ Waveform (VIANA) is shown below.



2-10 Screen Home Position Sensor Board

1) Circuit Operation

This circuit is made up of a reflective type optsensor and the buffer circuit.

There are 2 black marks at the bottom of the screen which absorbs light effectively.

When the sensor detects a black mark, the output signal "SHEND" becomes "L", and input into the CPU from D7 Port.

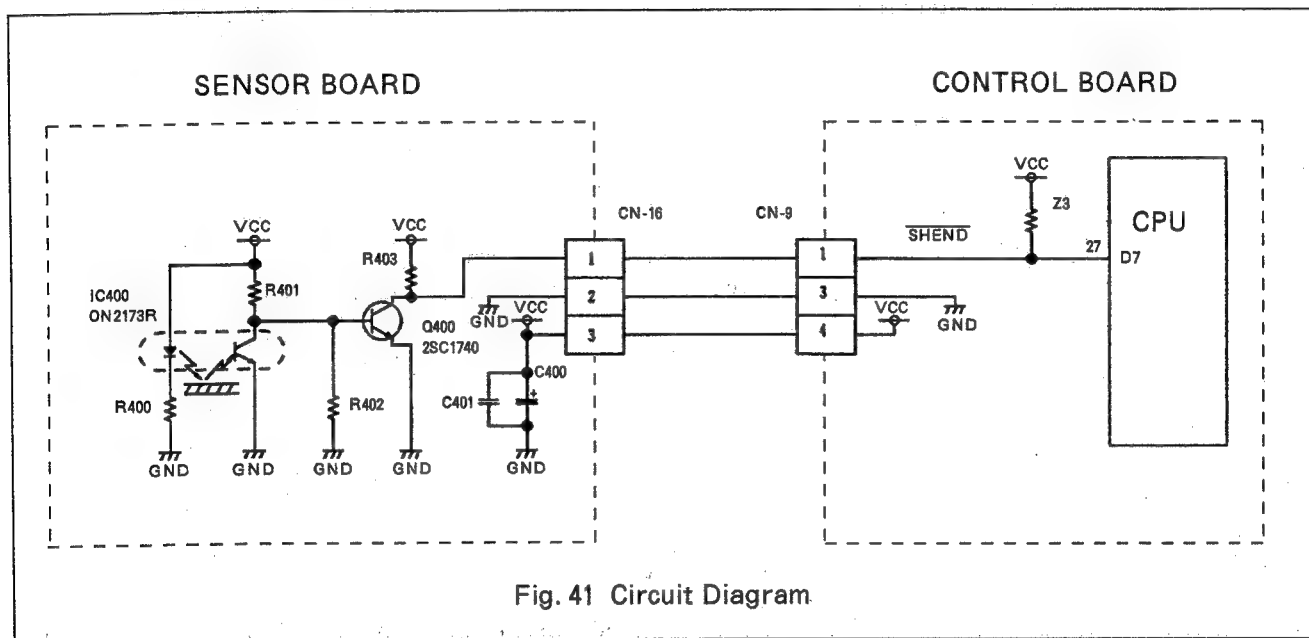


Fig. 41 Circuit Diagram

When the screen mark is not in position, the optical sensor "ON2173-R" IC400 receives the light being reflected by the screen and the photo-transistor is "ON". The base ① of transistor Q400 is less than 0.6 V and it remains "OFF".

When the black screen mark comes, the light is not received, the photo-transistor goes "OFF", and Q400 goes "ON". Output ② "SHEND" becomes "L".

2-11 Operation Panel Board

1) Circuit Operation

In this board, two keys and two LEDs are included, copy key, feed key, paper out LED and power LED.

Circuit diagram is shown below.

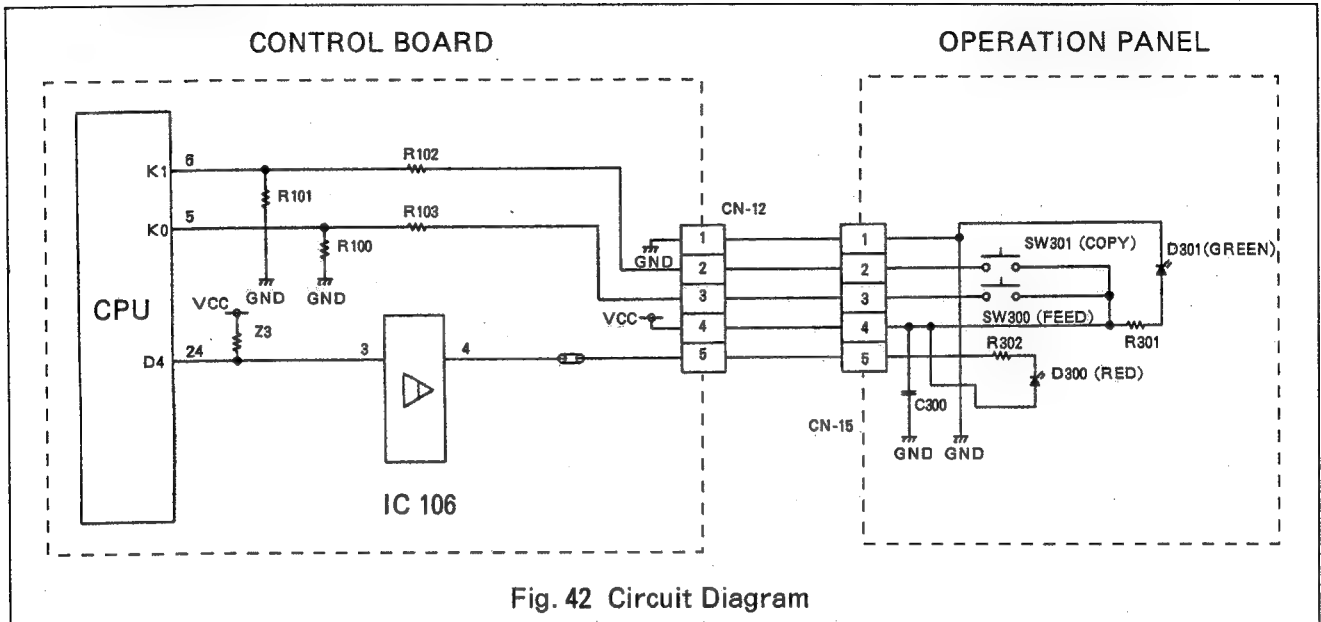


Fig. 42 Circuit Diagram

When the key is pressed, "H" signal is inputted to the CPU. According to its signal the CPU starts the programed function.

When the CPU detects the paper out signal from the paper sensor, the CPU makes a signal to turn the paper out LED on.

2-12 Paper Out Sensor

1) Circuit Operation

A micro switch is used.

When the paper is out, the micro switch is open, and accordingly the signal PAEND becomes high level.

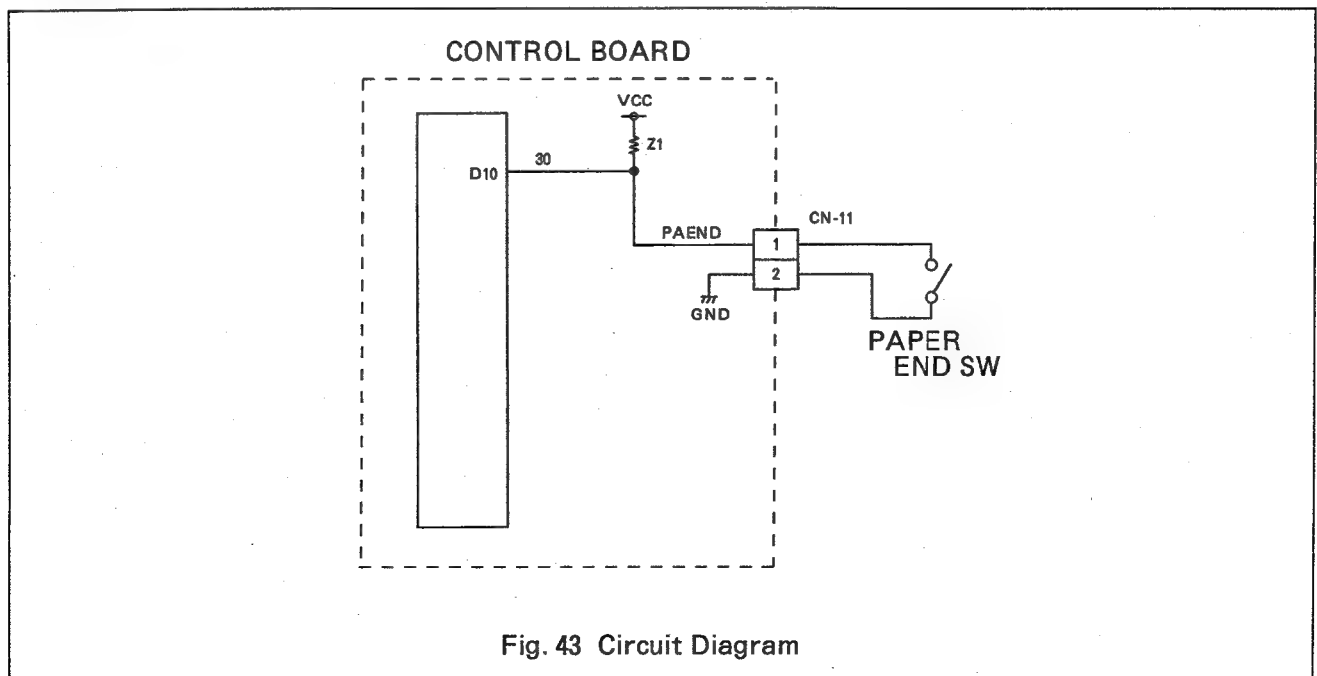


Fig. 43 Circuit Diagram

3. MAIN UNIT

3-1. +24V Output System

3-1-1. Description of Operation

IC3 is the single output regulator for 24V using step-down chopper with cut-off function.

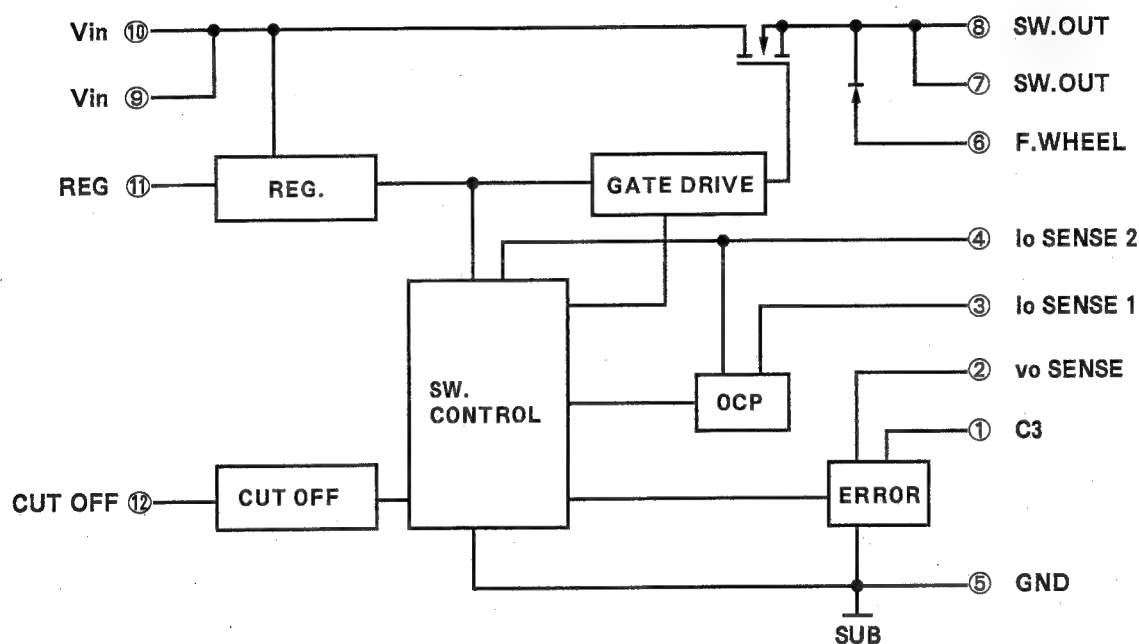
Figure below shows the block diagram of IC3.

AC voltage is supplied from pins 1 and 2 of IC3, full-wave rectified by D3 is stored at capacitor C13.

When the charging voltage of C13 exceeds DC28V, pin 12(cut-off terminal) of IC3 becomes high, IC3 is activated and DC+24V is sent to pin 2 of IC3.

L11 and L12 are choke coils, and R13 and C21 are for switching pulse reduction.

BLOCK DIAGRAM



3-1-2. Overvoltage Protection Circuit OVP

Detects the output voltage of IC3 at pin 2 of IC3, feedback, and sets it between the range of DC23.6V to DC24.4V.

When the output voltage exceeds 27V, zener diode ZD1 (27V) is activated to restrict the voltage to 27V.

3-1-3. Over Current Protection Circuit +CLM

When the output current exceeds DC10A, the voltage generated at resistor R12 between pin 3 and 4 of IC3 is detected at pin 4 of IC3, over current protection is activated to shut down the output.

3-2. DC +5V, +12V, -12V Output Systems

IC1, IC2 and IC4 are three-terminal regulators.

AC voltage is supplied from pins 3 and 4 of CN-3, half-wave rectified by D1 and D2, and is smoothed to DC by smoothing capacitors C4 and C5.

When DC voltage is supplied to three-terminal regulator IC1, IC1 is activated, and outputs DC+12. When DC voltage is supplied to three-terminal regulator IC2, it outputs DC+5V.

When DC voltage is supplied to three-terminal regulator IC4, IC4 is activated, and outputs DC -12V.

ZD2(13V) is for overvoltage protection and for noise absorption.

C6, 7, 8, 9, 10, 11 and 12 are for vibration protection and for noise absorption.

IC1, 2 and 4 have built-in over current protection circuits. Rated output voltage, rated output current, and starting current for over current protection are as follows:

	IC1	IC2	IC4
Rated output Voltage	+12V	+5V	-12V
Rated output current	0.5A	0.5A	0.5A

3-3. Fluorescent Lamp Circuit (LAMP DRIVE)

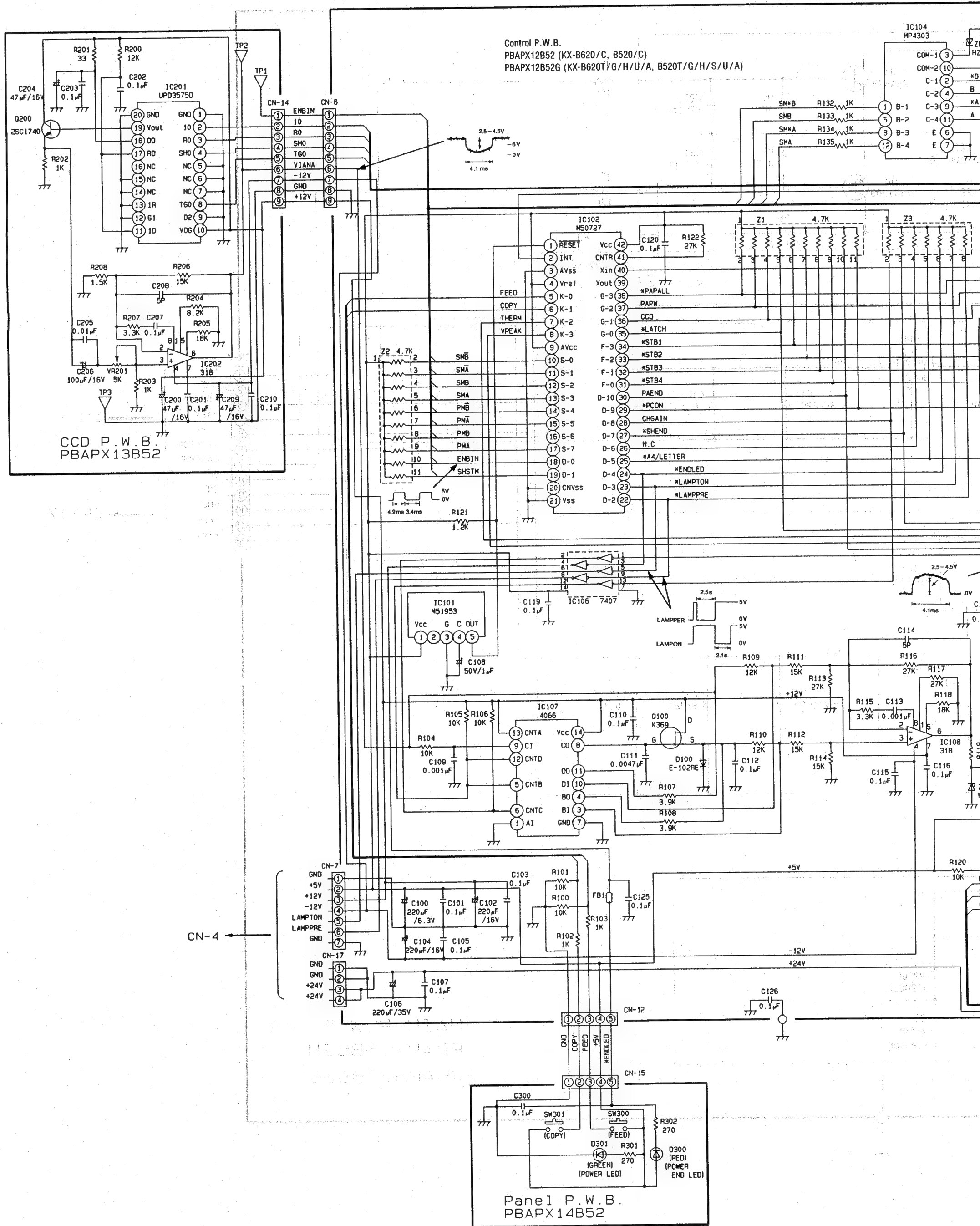
When terminal ⑦ of CN-7 (preheat signal terminal) becomes 0V, transistor Q4 goes ON, current is supplied to Q4→R8→LAMP heater→NS1 winding (T1)→LAMP heater→NS2 winding (T1)→GND and the LAMP heater is over-heated.

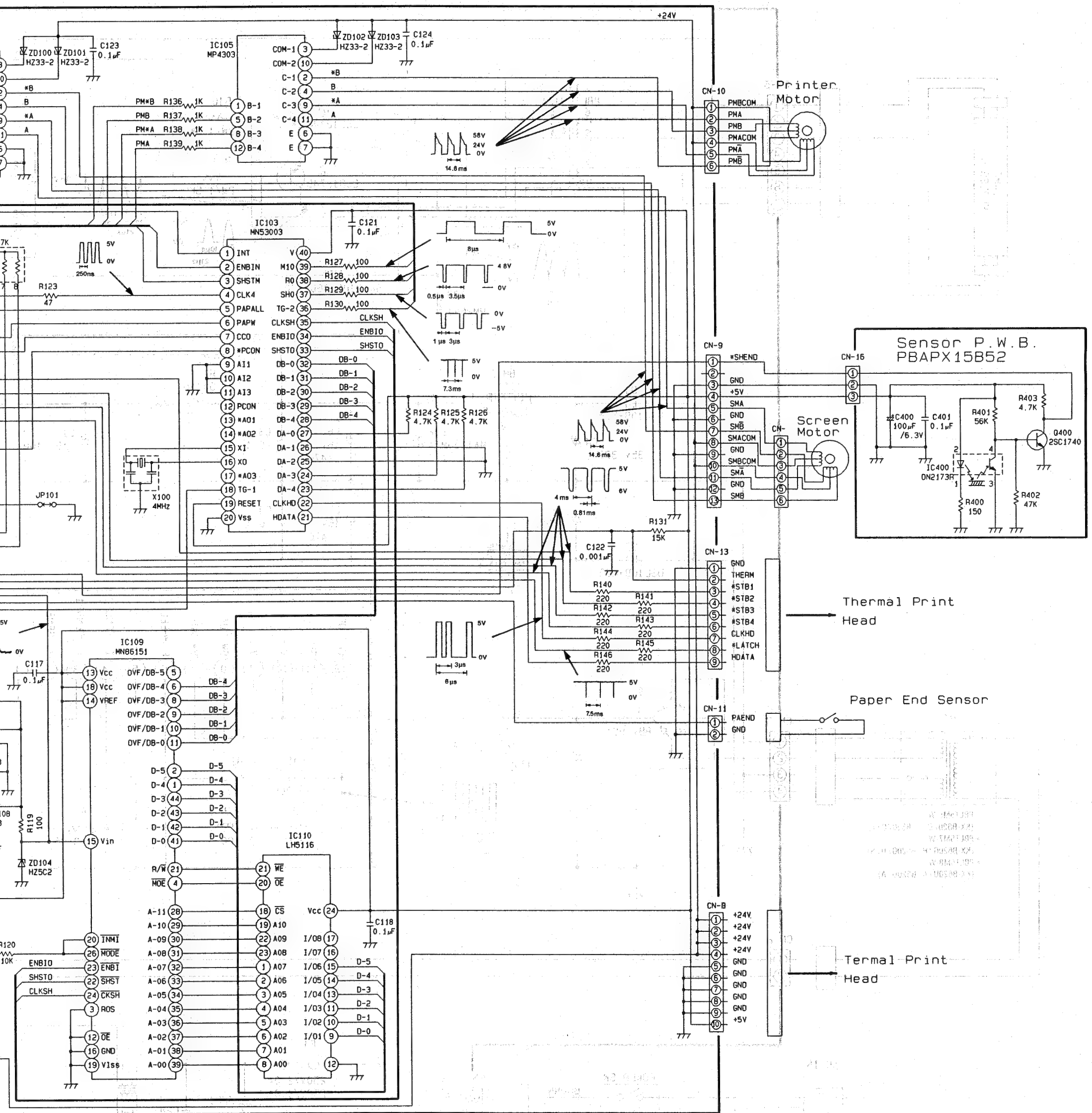
The voltage is set at 7.1V, and resistor R8 and the NS1 and NS2 winding resistors divide it into +24V.

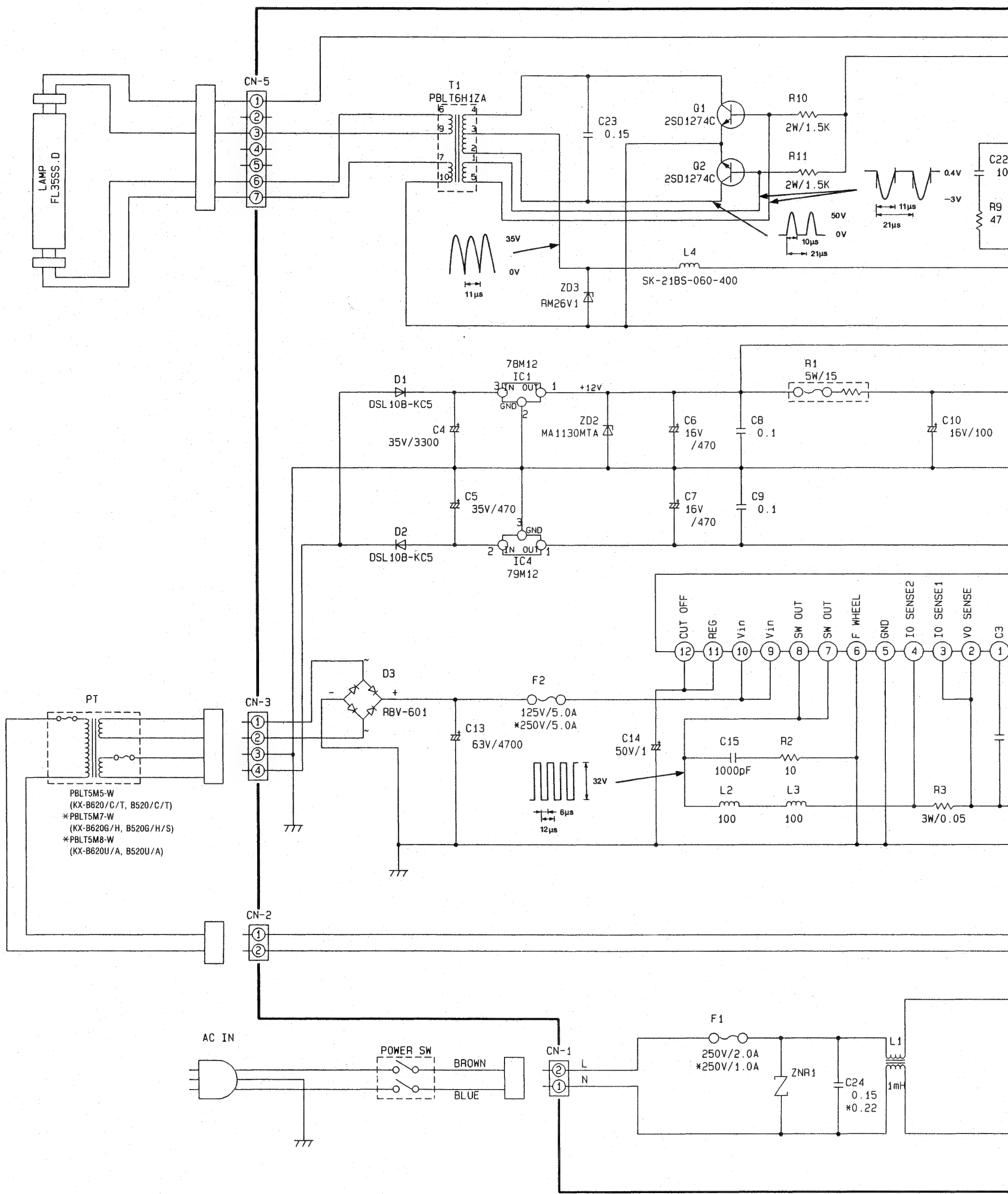
After 2.5 seconds, when the preheat signal becomes HIGH, Q4 turns off and current is not supplied to the LAMP heater, terminal ⑥ (LAMP ON signal terminal) becomes 0V, transistor Q3 goes ON, current is supplied to base resistors R10 and R11 of transistors Q1 and Q2 and then oscillation starts. This circuit is the push-pull voltage resonance circuit in which resonance occurs by primary winding inductance of transformer T1 and condenser C23, and switch it to a sine wave form.

At that time the surge voltage is generated when the LAMP turns on, Vce of Q1 and Q2 may exceed the specified value and be destroyed. To prevent this, Zener diode ZD3 is used to absorb the surge voltage.

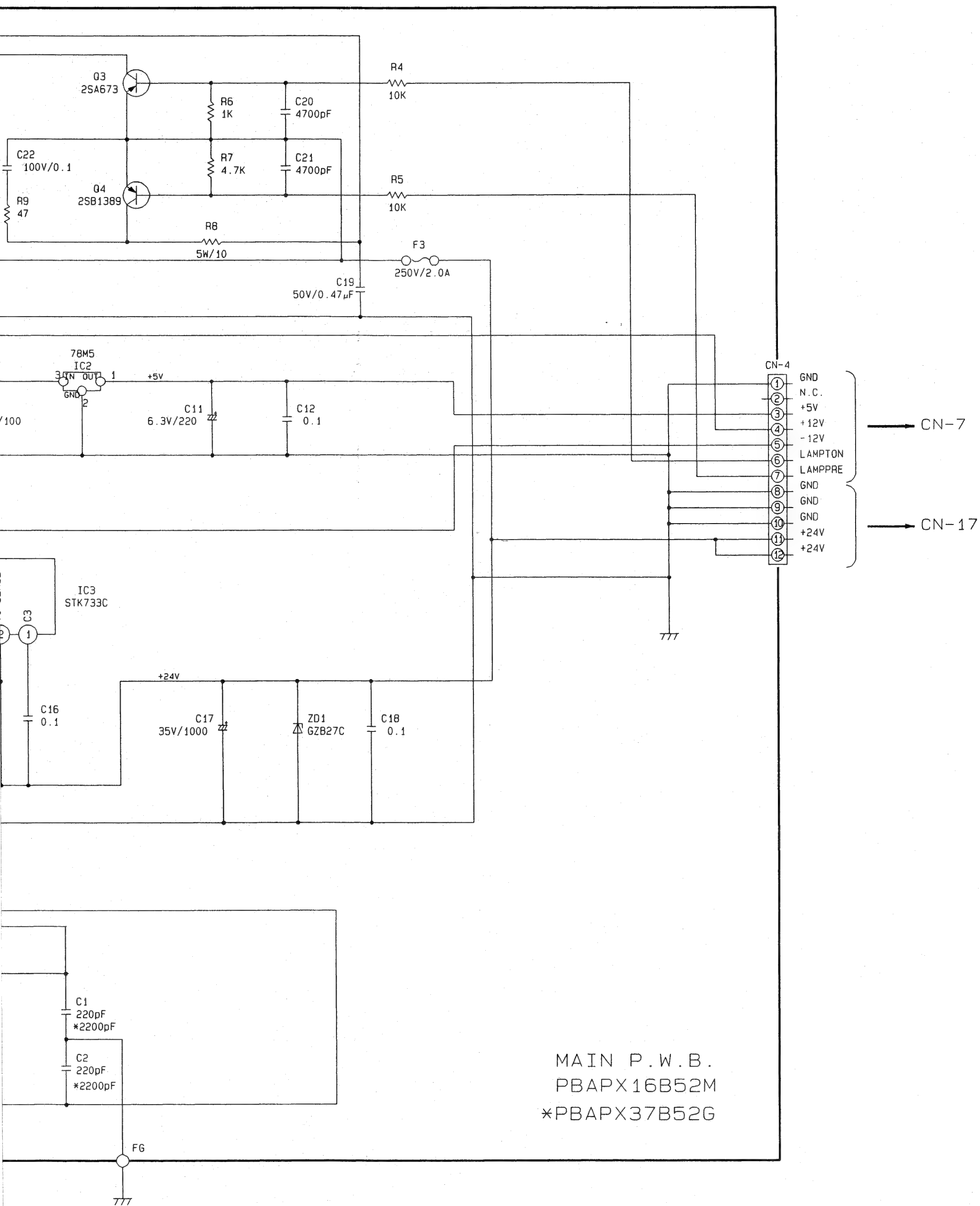
14. SCHEMATIC DIAGRAM







※ These components are available for the unit
the power source 220—240V.



15. CIRCUIT BOARD

No	Signal Name	On	Off	Description of Signal
1	+24V	+24V		DC +24V
2	+24V	+24V		DC +24V
3	+24V	+24V		DC +24V
4	+24V	+24V		DC +24V
5	GND	0V		Ground
6	GND	0V		Ground
7	GND	0V		Ground
8	GND	0V		Ground
9	GND	0V		Ground
10	+5V	+5V		DC +5V

No	Signal Name	On	Off	Description of Signal
1	GND	0V		Ground
2	GND	0V		Ground
3	+24V	+24V		DC +24V
4	+24V	+24V		DC +24V

No	Signal Name	On	Off
1	GND	0V	
2	+5V	+5V	
3	+12V	+12V	
4	-12V	-12V	
5	LAMPTON	0V	24V
6	LAMPPRE	0V	24V
7	GND	0V	

CONTROL BOARD

No	Signal Name	On	Off	Description of Signal
1	*SHEND	0V	+5V	Screen sensor signal
2	N.C.	—	—	Non connection
3	GND	0V	—	Ground
4	+5V	+5V	—	DC +5V
5	SMA	Pulse	—	Motor drive signal
6	GND	0V	—	Ground
7	SMB	Pulse	—	Motor drive signal
8	SMACOM	+24V	—	Drive power supply
9	GND	0V	—	Ground
10	SMBCOM	+24V	—	Drive power supply
11	SMA	Pulse	—	Motor drive signal
12	GND	0V	—	Ground
13	SMB	Pulse	—	Motor drive signal

No	Signal Name	On	Off	Description of Signal
1	PMB _{COM}	+24V		Drive power supply
2	PMA	Pulse		Motor drive signal
3	PMB	Pulse		Motor drive signal
4	PMACOM	+24V		Drive power supply
5	PM \bar{A}	Pulse		Motor drive signal
6	PM \bar{B}	Pulse		Motor drive signal

No	Signal Name	On	Off	Description of Signal
1	PAEND	+5V	0V	Paper sensor signal
2	GND	0V		Ground

No	Signal Name	On	Off	Description of Signal
1	GND	0V		Ground
2	COPY	+5V	0V	Print key input signal
3	FEED	+5V	0V	Feed key input signal
4	+5V	+5V		DC +5V
5	ENDLED	0V	+3V	Paper end signal

No	Signal Name	On	Off	Description of Signal
1	FILAMENT	1V		AC 1V
2	N.C.	—		Non connection
3	FILAMENT	1V		AC 1V
4	N.C.	—		Non connection
5	N.C.	—		Non connection
6	FILAMENT	≈ 100V		AC 100V
7	FILAMENT	≈ 100V		AC 100V

MAIN BOARD

No	Signal Name	On	Off	Description of Signal
1	GND	0V		Ground
2	N.C.	——		Non connection
3	+5V	+5V		DC +5V
4	+12V	+12V		DC +12V
5	-12V	-12V		DC -12V
6	TON	24V	0V	Lamp turn on signal
7	PRE	24V	0V	Lamp preheats signal
8	GND	0V		Ground
9	GND	0V		Ground
10	GND	0V		Ground
11	+24V	+24V		DC +24V
12	+24V	+24V		DC +24V

No	Signal Name	Description of Signal
1	N	AC 120V, 60Hz
		AC 110V, 60Hz
		AC 220—230V, 50/60Hz
		AC 230—240V, 50Hz
2	L	AC 120V, 60Hz
		AC 110V, 60Hz
		AC 220—230V, 50/60Hz
		AC 230—240V, 50Hz

No	Signal Name	On	Off
1	sec. 1	34V	
2	sec. 1	34V	
3	sec. 2	18V	
4	sec. 2	18V	

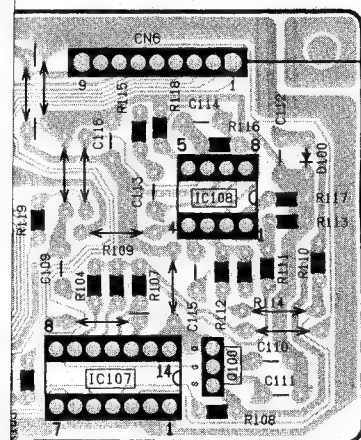
	Ratings of Fuse
*1	T2. 0A, L, 250V
	T1. 0A, H, 250V
*2	F5. 0A, L, 125V
	F5. 0A, L, 250V

No	Signal Name	D
1	N	AC 120V
		AC 110V
		AC 220-2
		AC 230-
2	NC	AC 120V
		AC 110V
		AC 220-2
		AC 230-2

CN-6

n	Off	Description of Signal
	0V	Ground
	+5V	DC +5V
	+12V	DC +12V
	-12V	DC -12V
V	24V	Lamp turn on signal
V	24V	Lamp preheats signal
	0V	Ground

No	Signal Name	On	Off	Description of Signal
1	ENBI	Pulse		CCD Data enable signal
2	$\phi 10$	Pulse		CCD clock
3	$\phi R0$	Pulse		Reset clock
4	$\phi SH0$	Pulse		Sample-Hold clock
5	ϕTG	Pulse		Trigger clock
6	VIANA	0-5V		CCD output signal
7	-12V	-12V		DC -12V
8	GND	0V		Ground
9	+12V	+12V		DC +12V



CN-13

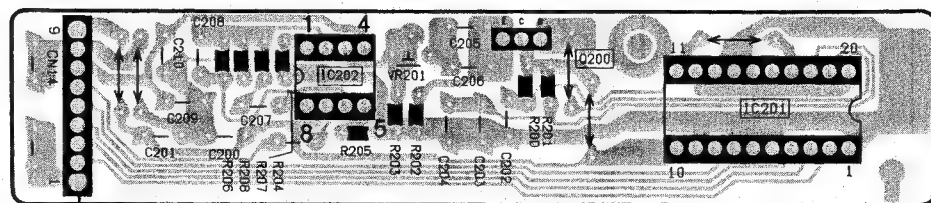
No	Signal Name	On	Off	Description of Signal
1	GND	0V		Ground
2	THERM	0V-5V		Thermistor signal
3	STB1	Pulse		Data strobe signal 1
4	STB2	Pulse		Data strobe signal 2
5	STB3	Pulse		Data strobe signal 3
6	STB4	Pulse		Data strobe signal 4
7	CLKHD	Pulse		Head clock signal
8	LATCH	Pulse		Head latch signal
9	HDATA	Pulse		Head data

On	Off	Description of Signal
34V		AC 34V
34V		AC 34V
18V		AC 18V
18V		AC 18V

of Fuse	Models
250 V	KX-B620/C/T, KX-B520/C/T
250 V	KX-B620A/G/H/U, KX-B520A/G/H/S/U
125 V	KX-B620/C/T, KX-B520/C/T
250 V	KX-B620A/G/H/U, KX-B520A/G/H/S/U

Description of Signal
AC 120V, 60Hz
AC 110V, 60Hz
AC 220–230V, 50/60Hz
AC 230–240V, 50Hz
AC 120V, 60Hz
AC 110V, 60Hz
AC 220–230V, 50/60Hz
AC 230–240V, 50/60Hz

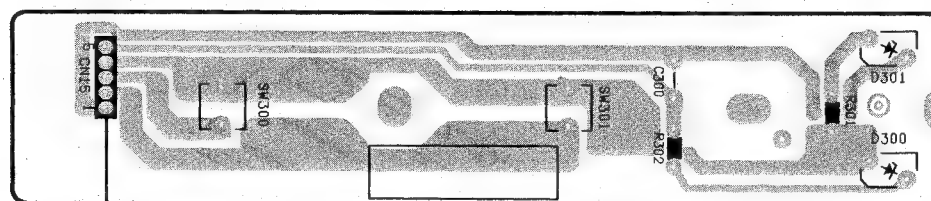
CCD BOARD



CN-14

No	Signal Name	On	Off	Description of Signal
1	ENBI	Pulse		CCD Data enable signal
2	ϕ 10	Pulse		CCD clock
3	ϕ R0	Pulse		Reset clock
4	ϕ SH0	Pulse		Sample-Hold clock
5	ϕ TG	Pulse		Trigger clock
6	VIANA	0—5V		CCD output signal
7	—12V	—12V		DC —12V
8	GND	0V		Ground
9	+12V	+12V		DC +12V

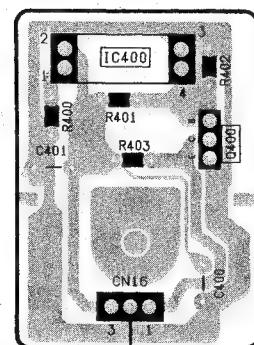
PANEL BOARD



CN-15

No	Signal Name	On	Off	Description of Signal
1	GND		0V	Ground
2	COPY	+5V	0V	Print key input signal
3	FEED	+5V	0V	Feed key input signal
4	+5V		+5V	DC +5V
5	ENDLED	0V	≈3V	Paper end signal

SENSOR BOARD

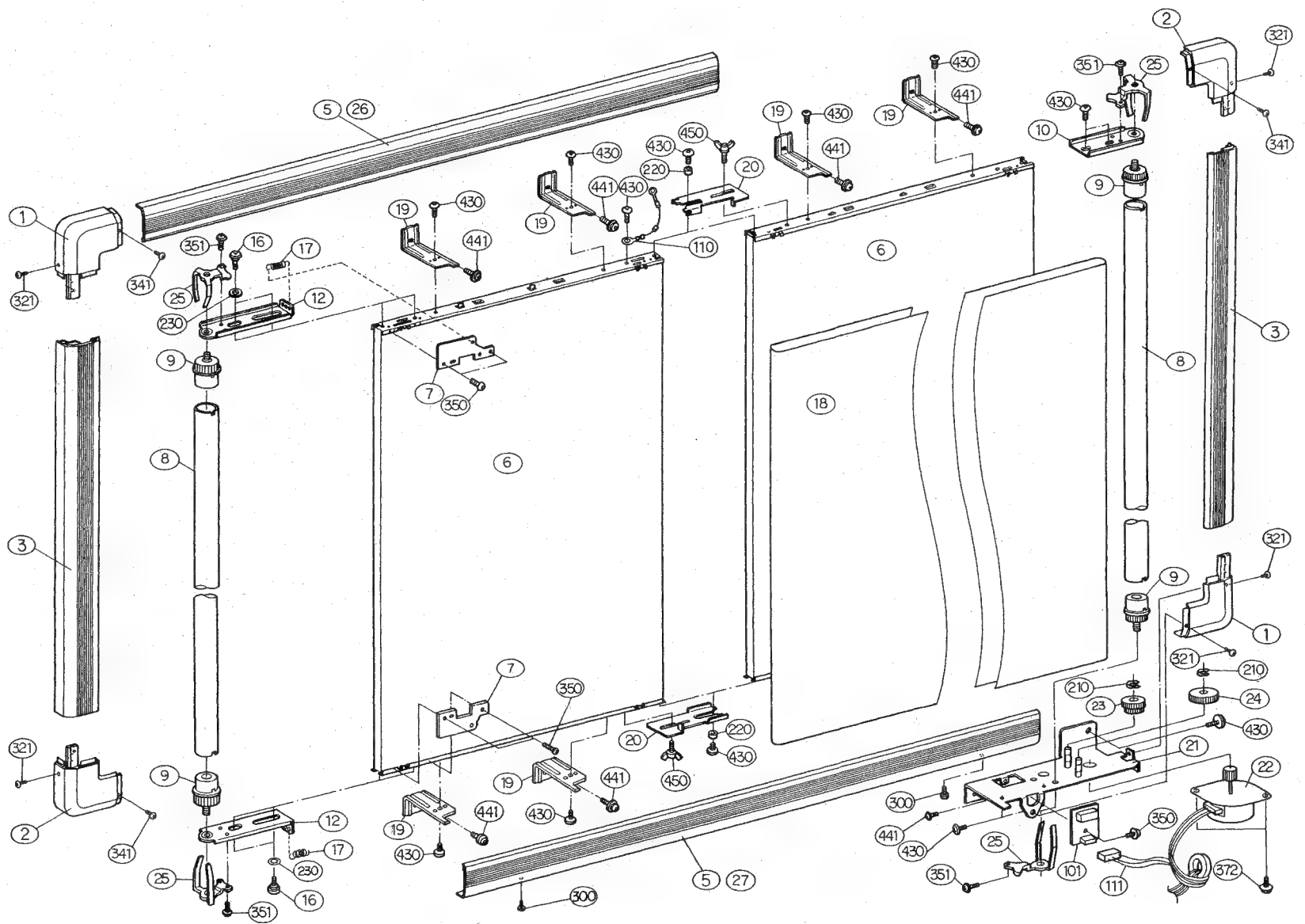


CN-16

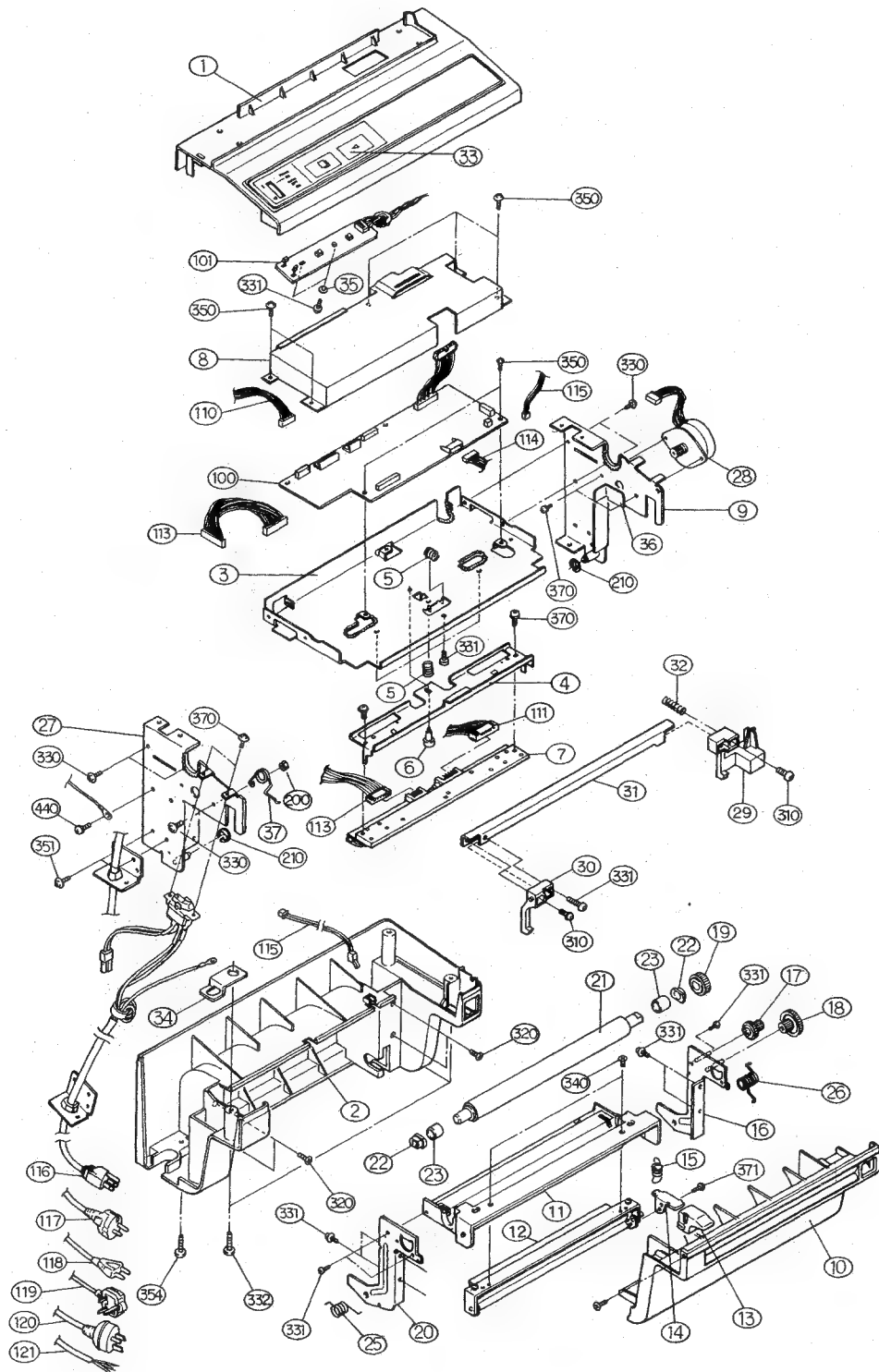
No	Signal Name	On	Off	Description of Signal
1	*SHEND	0V	+5V	Screen sensor signal
2	GND	0V		Ground
3	+5V	+5V		DC +5V

16. MECHANICAL PARTS LOCATION

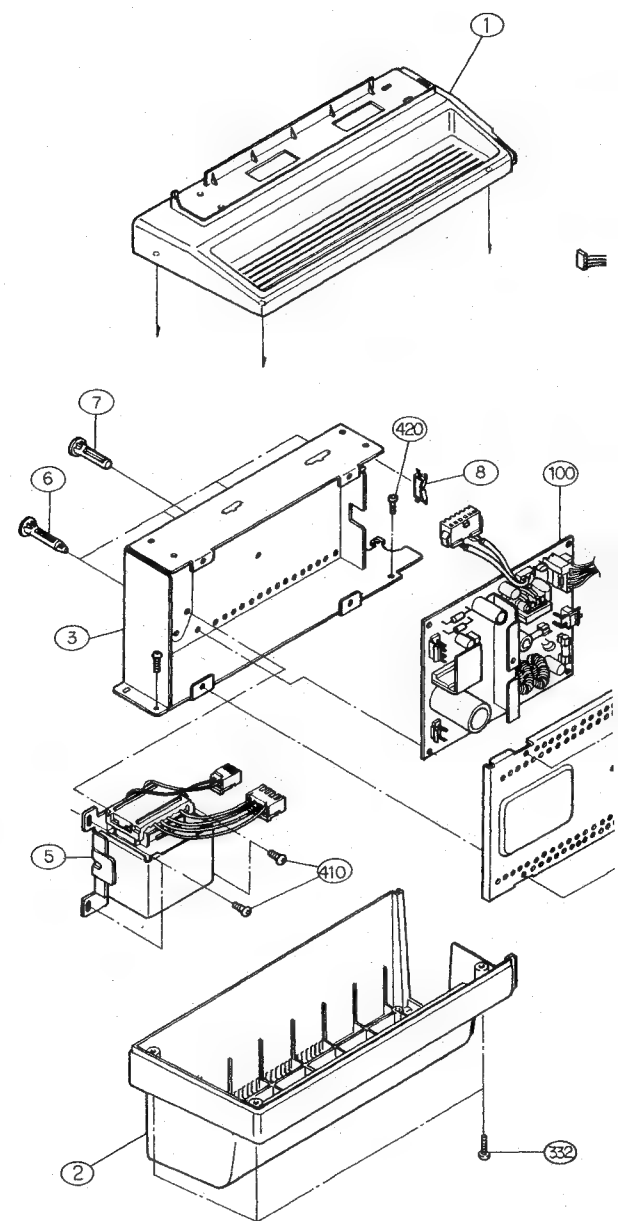
A



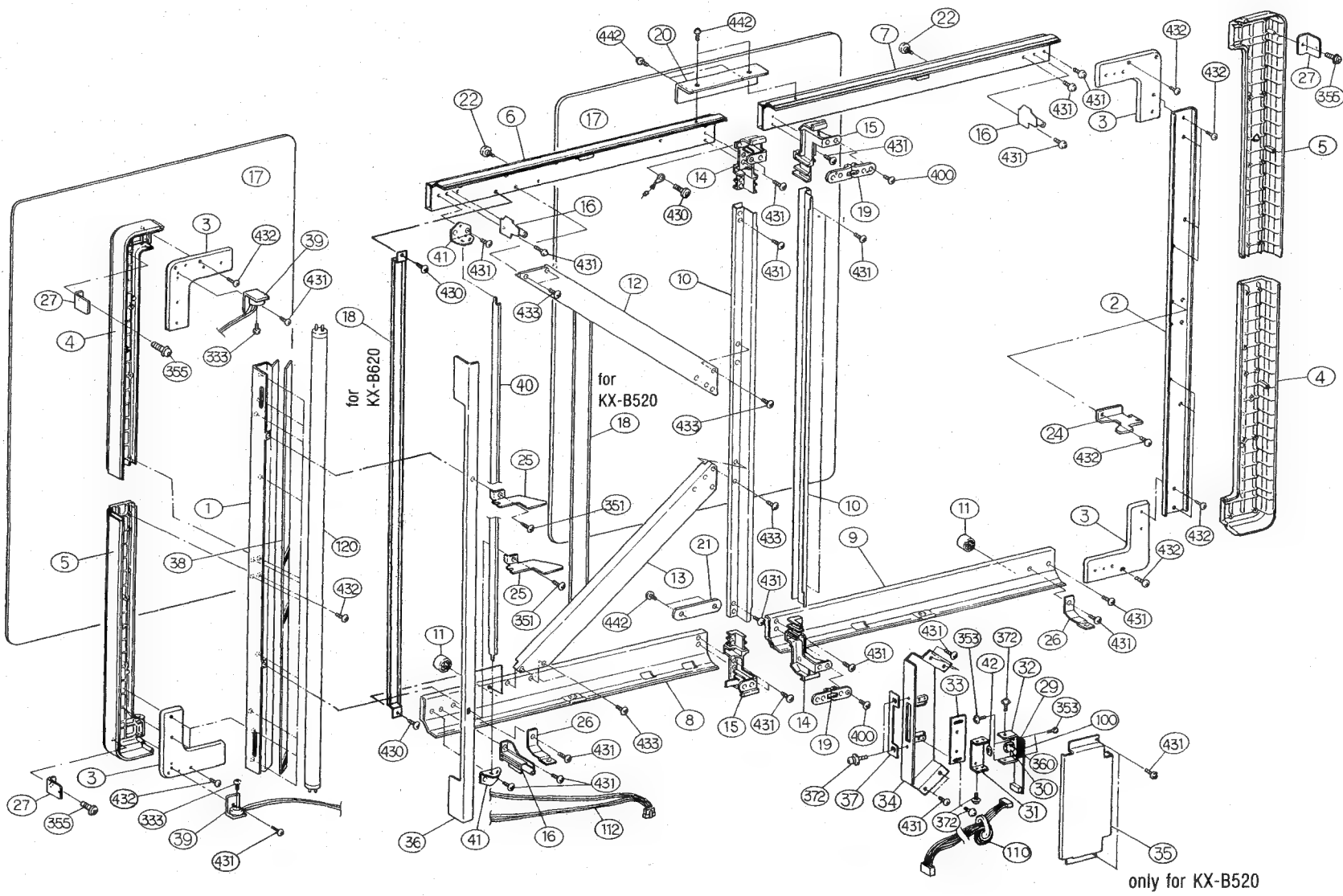
C



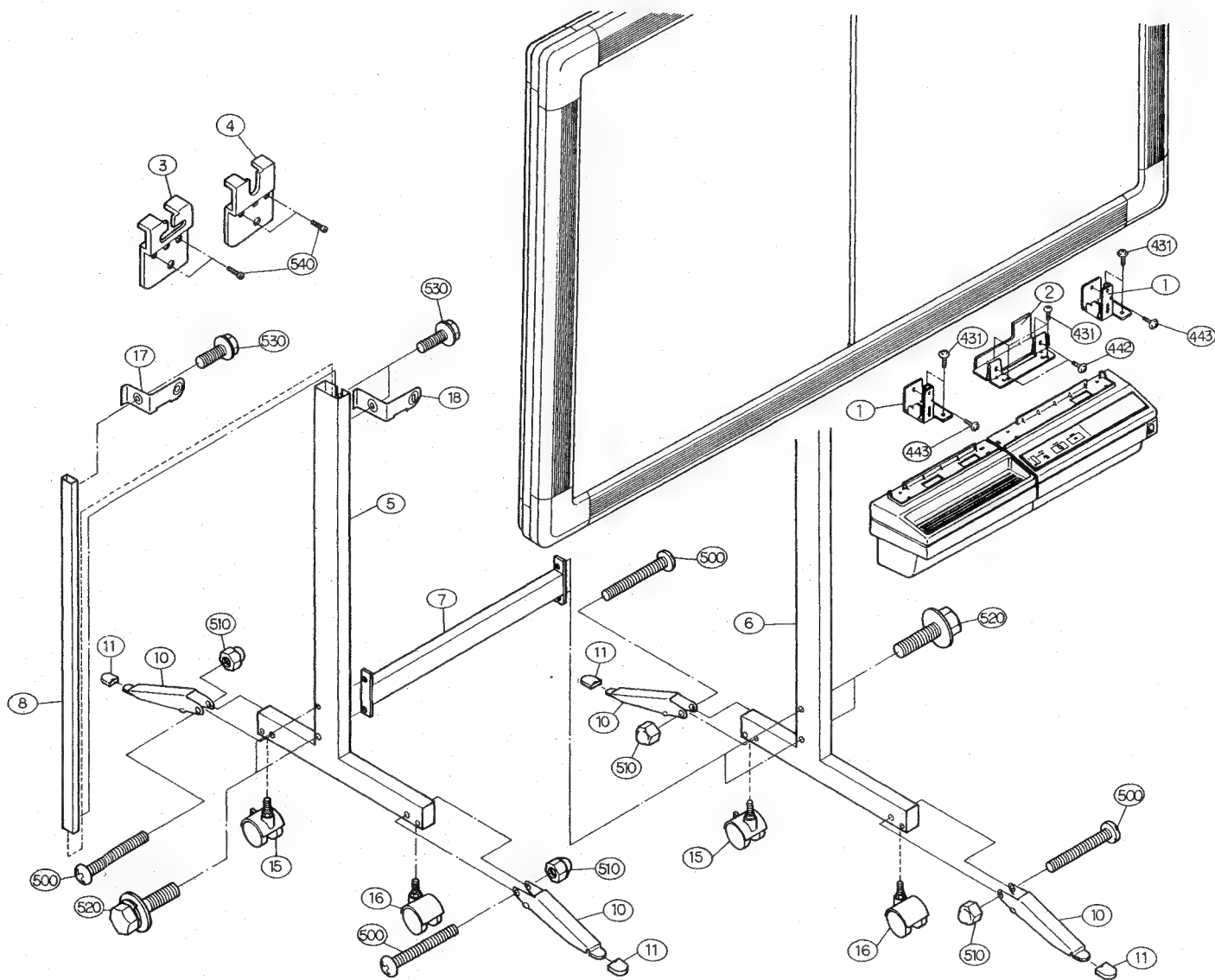
D



B



Ⓔ



17. REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the Δ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

NOTE:

- The marking (RTL) indicates that the Retention Time is Limited for this item. After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly will no longer be available.
- In KX-B520 Series, components that the \square mark is indicated in the Q'ty column are used for only the product with the \square mark on the nameplate.

1. Mechanical Parts

Ref. No.	Part No.	Description	Q'ty	Ref. No.	Part No.	Description	Q'ty
(A) - 1	PBGC1Z52	Corner Frame Cover A Δ	2	(B) - 7	PBKM4Z52-J	Frame B (KX-520 Series)	1
(A) - 2	PBGC2Z52	Corner Frame Cover B Δ	2	(B) - 8	PBKMA0019Z-J	Frame C (KX-620 Series)	1
(A) - 3	PBGC3Z52	Frame Cover A Δ	2	(B) - 8	PBKM19Z52-J	Frame C (KX-520 Series)	1
(A) - 5	PBGC5Z52	Frame Cover C Δ (KX-B520 Series)	2	(B) - 9	PBKMA0020Z-J	Frame D (KX-620 Series)	1
(A) - 6	PBUEA0031Z-J	Middle Plate Ass'y (KX-B620 Series)	2	(B) - 9	PBKM20Z52-J	Frame D (KX-520 Series)	1
(A) - 6	PBUE3Y52-J	Middle Plate Ass'y (KX-B520 Series)	2, \square	(B) - 10	PBKMA0001Z52	Frame E	2
(A) - 7	PBULA0001Z52	Bracket	2, \square	(B) - 11	NF1U5552	Foot	2
(A) - 8	PBDR1Z52	Roller	2	(B) - 12	PBUA9Y	Support Frame A	1
(A) - 9	PBUD1Y52	Roller with Gear	4, \square	(B) - 13	PBUA8Y	Support Frame B	1
(A) - 10	PBMDA0001Z52	Bracket A (Roller)	1, \square	(B) - 14	PBUC3Z52	Joint A	2
(A) - 12	PBMD4Z40	Bracket C (Roller)	2, \square	(B) - 15	PBUC4Z52	Joint B	2
(A) - 16	PBHD3Z40	Spacer Screw	4, \square	(B) - 16	PBHR3Z52	Bracket (Frame Cover)	3
(A) - 17	PBDS10Z40	Spring	2, \square	(B) - 17	PBKUA0001Z	Rear Cover Δ	2
(A) - 18	PBUEA0032Z-J	Screen (KX-B620 Series) Δ	1	(B) - 18	PBBYA0005Z	Bracket (Rear Cover) (KX-620 Series)	1
(A) - 18	PBUE2Z52-J	Screen (KX-B520 Series) Δ	1	(B) - 18	PBBY2Z52-J	Bracket (Rear Cover) (KX-520 Series)	1
(A) - 19	PBMDA0002Z52	Bracket (Middle Plate Ass'y)	7, \square	(B) - 19	PBBH1Z52	Hinge	2
(A) - 20	PBHMA0005Z52	Bracket Slide	2, \square	(B) - 20	PBHM6Z52	Bracket (Frame Fixture (U))	1
(A) - 21	PBMMA0001Y	Bracket (Screen Feed Motor) (KX-B620 Series)	1	(B) - 21	PBHM4Z52	Bracket (Frame Fixture (L))	1
(A) - 21	PBMMA0001Z52	Bracket (Screen Feed Motor) (KX-B520 Series)	1, \square	(B) - 22	PBHD2Z52	Wall Mounting Screw	2
(A) - 22	PBAMA0004Z	Screen Feed Motor Δ (KX-B620 Series)	1	(B) - 24	PBUL1Z52	Bracket (Frame Cover (R))	1
(A) - 22	PBAMA0002Z52	Screen Feed Motor Δ (KX-B520 Series)	1, \square	(B) - 25	PBUL2Z52	Bracket (Frame Cover (L))	2
(A) - 23	PBUD6Z52	Idel Gear	1	(B) - 26	PBMD24Z52	Bracket (Frame Cover Fixture)	2
(A) - 24	PBUD2Z52	Idel Gear	1	(B) - 27	PBUL3Z52	Bracket (Corner Frame Cover)	3
(A) - 25	PBHR26Z40	Screen Holder	4, \square	(B) - 29	PBHR1Z52	Lens Holder	1
(A) - 26	PBGCA0001Z	Frame Cover (upper) Δ (KX-B620 Series)	1	(B) - 30	PBUE5Z52	Lens	1
(A) - 27	PBGCA0002Z	Frame Cover (lower) Δ (KX-B620 Series)	1	(B) - 31	PBMD1Z52	Bracket (Lens Unit Holder A)	1
(B) - 1	PBUA1Z52-J	Bracket (Left Frame)	1	(B) - 32	PBMD2Z52	Bracket (Lens Unit Holder B)	1
(B) - 2	PBUA6Z52	Bracket (Right Frame)	1	(B) - 33	PBMD3Z52	Bracket (Lens Unit Holder C)	1
(B) - 3	PBUA7Z52	Bracket (Corner Frame)	4	(B) - 34	PBMDA0150Z	Bracket (Lens Unit Ass'y) (KX-620 Series)	1
(B) - 4	PBKM1Z52	Corner Frame A Δ	2	(B) - 34	PBMD4Z52	Bracket (Lens Unit Ass'y) (KX-520 Series)	1
(B) - 5	PBKM2Z52	Corner Frame B Δ	2	(B) - 35	PBMC4Z52	Bracket (CCD Shield) (KX-520 Series only)	1
(B) - 6	PBKMA0017Z-J	Frame A (KX-620 Series)	1	(B) - 36	PBMC5Z52	Bracket (Lamp Shield)	1
(B) - 6	PBKM3Z52-J	Frame A (KX-520 Series)	1	(B) - 37	PBMZ1Z52	Bracket (Light Interceptor)	1
(B) - 7	PBKMA0018Z-J	Frame B (KX-620 Series)	1	(B) - 38	PBUE1Z52	Mirror	1
				(B) - 39	PBMK1Z52	Bracket (Lamp Socket)	2
				(B) - 40	PBMZA0001Z52	Reflector	1, \square
				(B) - 41	PBUHA0001Z52	Bracket (Reflector)	2, \square
				(B) - 42	PBMZ2Z52	Lens Shield	1

KX-B620 Series
KX-B520 Series

Ref. No.	Part No.	Description	Q'ty
© - 1	PBKM10Z-J	Printer Cover (Upper) Δ	1
© - 2	PBKM11Z52	Printer Cover (Lower) Δ	1
© - 3	PBUA4Z52	Chassis	1
© - 4	PBMH1Z52	Bracket (Printer Head)	1
© - 5	PQUS176Y52	Spring (Printer Head)	5
© - 6	PQHD23Z52	Screw (Printer Head)	1
© - 7	PBEZ2Y40	Printer Head Δ	1, [a]
© - 8	PBMC1Z52	Shield Cover (Control Board)	1
© - 9	PBUA10Z52	Chassis (Right Ass'y)	1
© - 10	PBKE1Z52-J	Printer Door Δ	1
© - 11	PBUA5Z52-J	Printer Chassis	1
© - 12	PBUE4Z52-J	Cutter	1
© - 13	PBBS1Z52	Cutter Lever	1
© - 14	PBHM1Z52	Bracket (Cutter)	1
© - 15	PBDS2Z52	Spring (Cutter)	1
© - 16	PBUC10Z52	Bracket (Printer Door (R) Ass'y)	1
© - 17	PQDG5017Z52	Gear A	1
© - 18	PQDG5018Z52	Gear B	1
© - 19	PQDG5028Z52	Gear C	1
© - 20	PBUC2Z52	Bracket (Printer Door (L) Ass'y)	1
© - 21	PQDN13Z52	Paper Feed Roller	1
© - 22	XLL6Z52	Bearings (1)	2
© - 23	XLL7Z52	Bearings (2)	2
© - 25	PBDS1Z52	Spring A (Printer Door)	1
© - 26	PBDS4Z52	Spring B (Printer Door)	1
© - 27	PBUA11Z52	Chassis (Left Ass'y)	1
© - 28	PF4248C51052	Paper Feed Motor Δ	1
© - 29	PBBC1Z52	Printer Door Button	1
© - 30	PBHR5Z52	Printer Door Lever	1
© - 31	PBUB1Z52	Bracket (Stopper)	1
© - 32	PBDS3Z52	Spring (Stopper)	1
© - 33	PBGPA0026Z	Control Panel Sheet Δ (KX-B620 Series)	1
© - 33	PBGP1Z52	Control Panel Sheet Δ (KX-B520 Series)	1
© - 34	PBUL8Z52	Bracket Reinforce	1
© - 35	RW0CF79050Z	Washer	2
© - 36	PBHM9Z52	Gear Cover Bracket	1
© - 37	PBDS6Z52	Aid Lock Spring	1
© - 1	PBKM8Z52-J	Tray (Upper) Δ	1
© - 2	PBKM9Z52	Tray (Lower) Δ	1
© - 3	PBMCA0001Z52	Shield Base (PSU)	1, [a]
© - 4	PBMCA0002Z52	Shield Cover (PSU)	1, [a]
© - 5	PBLT5M5W52	Transformer (KX-B520, C, T) (KX-B620, C, T)	1, [a]
© - 5	PBLT5M7W52	Transformer (KX-B520G, H, S) (KX-B620G, H)	1, [a]
© - 5	PBLT5M8W52	Transformer (KX-B520U, A) (KX-B620U, A)	1, [a]
© - 6	KGLS-14RF	Locking Card Spacer	4, [a]
© - 7	KGPS-14RF	Card Spacer	1, [a]
© - 8	EDS-1	Edging Saddle	1, [a]
© - 1	PBMD19Z52-J	Bracket A (Printer)	2
© - 2	PBMD20Z52	Bracket B (Printer)	1
© - 3	PBMD17Y52	Fixture A (Wall Mounting)	1

Ref. No.	Part No.	Description	Q'ty
© - 4	PBMD18Y52	Fixture B (Wall Mounting)	1
© - 5	PBYL6Y52-J	Stand Base Ass'y (L)	1
© - 6	PBYL12Y52-J	Stand Base Ass'y (R)	1
© - 7	PBYL8Y52	Panel Support	1
© - 8	PBYL7Y52	Prop Upper Ass'y	2
© - 10	PBYL9Z52	Tiptoe Extension ※	4
© - 11	PBKL4Z52	Tiptoe Cover ※	4
© - 15	P42TSM815B52	Caster (Lock)	2
© - 16	P42TM815B52	Caster	2
© - 17	PBHMA0001Z52	Bracket A	2
© - 18	PBHMA0002Z52	Bracket B	2
	PBBYA0001Z52	Joint Bracket (For Packing)	1
	PBHPA0001Z52	Fold Up Roller	2

※ These components are used for KX-B06CS
(Optional Stand) only.

2. Screw and Other Parts

Ref. No.	Part No.	Description	Q'ty
200	XNT3EFX	Nut M3	
210	XUC4FY	E Ring M4	
220	MWSP4-20	Spacer M4	
230	RWPS7-025	Washer	
300	XTP3+8FXS	Screw M3 × 8	
310	XSN3+4FX	Screw M3 × 4	
320	XSS3+6FXS	Screw M3 × 6	
321	XSS3+12FYS	Screw M3 × 12	
330	XTN3+6FFX	Screw M3 × 6	
331	XTN3+10JFX	Screw M3 × 10	
332	XTN3+12JFX	Screw M3 × 12	
333	XTN3+14JFX	Screw M3 × 14	
340	XTS3+6FFX	Screw M3 × 6	
341	XTS3+12CFX	Screw M3 × 12	
350	XTW3+6LFX	Screw M3 × 6	
351	XTW3+8LFX	Screw M3 × 8	
352	XTW3+10SFX	Screw M3 × 10	
353	XTW3+W8SFX	Screw M3 × 8	
354	XTW3+10LFX	Screw M3 × 10	
355	XTW3+12SFX	Screw M3 × 12	
360	XXE3D5FPS	Screw M3 × 5	
370	XYN3+C5FX	Screw M3 × 5	
371	XYN3+C10FX	Screw M3 × 10	
372	XYN3+F6FX	Screw M3 × 6	
400	XSS4+8FXS	Screw M4 × 8	
410	XTB4+6FFY	Screw M4 × 6	
420	XTN4+12JFX	Screw M4 × 12	
430	XTT4+8FFY	Screw M4 × 8	
431	XTT4+10FFY	Screw M4 × 10	
432	XTT4+10JFX	Screw M4 × 10	
433	XTT4+18FFX	Screw M4 × 18	
440	XYN4+C8FX	Screw M4 × 8	
441	XYN4+F10FXS	Screw M4 × 10	
442	XYN4+F12FXS	Screw M4 × 12	
443	XYN4+F20FXS	Screw M4 × 20	
450	XVP4F6FX	Wing bolt M4 × 6	
500	XSN6+40FY	Screw M6 × 40	
510	XNA6DFY	Nut M6	
520	XVG8BF40FY	Screw M8 × 40	
530	XVG6BF20FY	Screw M6 × 20	
540	XSN6+20FYS	Screw M6 × 20	

3. Control Board

Ref. No.	Part No.	Description	Q'ty
© - 100	PBAPX12B52	Control PCB Ass'y (RTL) (KX-B520, C) (KX-B620, C)	1, Δ a
© - 100	PBAPX12B52G	Control PCB Ass'y (RTL) (KX-B520A, G, H, S, T, U) (KX-B620A, G, H, T, U)	1, Δ a
R119, R127 - 130	ERDS2TJ101	Resistor 100	5
R102 , 103 R132 - 139	ERDS2TJ102	Resistor 1k	10
R100 , 101 R104 - 106 R120	ERDS2TJ103	Resistor 10k	6
R121	ERDS2TJ122	Resistor 1.2k	1
R109 , 110	ERDS2TJ123	Resistor 12k	2
R111 , 112 R114 , 131	ERDS2TJ153	Resistor 15k	4
R118	ERDS2TJ183	Resistor 18k	1
R140 - 146	ERDS2TJ221	Resistor 220	7
R113 , 116 R117 , 122	ERDS2TJ273	Resistor 27k	4
R115	ERDS2TJ332	Resistor 3.3k	1
R107 , 108	ERDS2TJ392	Resistor 3.9k	2
R123	ERDS2TJ470	Resistor 47	1
R124 - 126	ERDS2TJ472	Resistor 4.7k	3
Z1 , Z2	Z11E472J	Resistor Arry 4.7k	2
Z3	Z8E472J	Resistor Arry 4.7k	1
JP101	PPJJ-10M	Jumper (A4 only)	1
C114	ECCW1H050CC	Capacitor 5pF	1
C109 , 113 C122	ECKW1H102KB	Capacitor 1000pF	3
C101 , 103 C105 , 107 C110 , 112 C115 , 116 C118 , 119 C123 - 126	ECFW1H104ZF	Capacitor 0.1 μ F	14
C117 , 120 C121	RPE132F104	Capacitor 0.1 μ F	3
C111	ECQP1472JZ	Capacitor 4700pF	1
C100	ECEA0JU221	Capacitor 220 μ F	1
C102 , 104	ECEA1CU221	Capacitor 220 μ F	2
C106	ECEA1VU221	Capacitor 220 μ F	1
C108	ECEA1HU010	Capacitor 1 μ F	1
D100	E-102RE	Diode	1
ZD104	HZ5C2	Diode (Zener)	1
ZD100 - 103	HZ33-2	Diode (Zener)	4
Q100	2SK369	Transistor	1
IC106	HD7407P	IC (TTL Normal)	1
IC109	MN86151	IC (Shading Corrector)	1
IC103	MN53003QPQ	IC (Gate Array)	1
IC104 , 105	MP4303	Transistor Array	2
IC110	LH5116D	IC (SRAM)	1

Ref. No.	Part No.	Description	Q'ty
IC108	NJM318D	IC (OP AMP)	1
IC107	MC14066BCP	IC (Analog SW)	1
IC101	PBM51953BL	IC (RESET)	1
IC102	PBM50727-750	IC (CPU)	1
X100	CST4.00MGW	Oscillator	1
	PAUX37802	Earth Terminal	1
FB1	PBB01	Beaded Core	1
CN6	B9B-XH	Connector	1
CN7	B7P-VH	Connector	Δ 1
CN8	ILS10P	Connector	Δ 1
CN9	PBJE3Y52	Motor Relay Cable	Δ 1, Δ a
CN10	B6B-XH	Connector	Δ 1
CN11	B2B-XH	Connector	Δ 1
CN12	PI22BA05M	Connector	Δ 1
CN13	ILS9P	Connector	Δ 1
CN17	B4P-VH	Connector	Δ 1

4. CCD Board

Ref. No.	Part No.	Description	Q'ty
④ - 100	PBAPX13B52	CCD PCB Ass'y (RTL)	Δ 1, Δ a
R202 , 203	ERDS2TJ102	Resistor 1k	2
R204	ERDS2TJ822	Resistor 8.2k	1
R200	ERDS2TJ123	Resistor 12k	1
R208	ERDS2TJ152	Resistor 1.5k	1
R206	ERDS2TJ153	Resistor 15k	1
R205	ERDS2TJ183	Resistor 18k	1
R201	ERDS2TJ330	Resistor 33	1
R207	ERDS2TJ332	Resistor 3.3k	1
VR201	DCAA03B53	Resistor 5k	1
C200 , 204 C209	ECEA1CU470	Capacitor 47 μ F	3
C206	ECEA1CU101	Capacitor 100 μ F	1
C208	ECCW1H050CC	Capacitor 5pF	1
C205	ECFW1H103KB	Capacitor 0.01 μ F	1
C201 - 203 C207 , 210	ECFW1H104ZF	Capacitor 0.1 μ F	5
IC201	UPD3575D	IC (CCD)	1
IC202	NJM318D	IC (OP AMP)	1
Q200	2SC1740S	Transistor	1
CN14	B9B-XH	Connector	Δ 1
④	PBHR24Z40	CCD Spacer	1

KX-B620 Series KX-B520 Series

5. Operation Panel and Sensor Board

Ref. No.	Part No.	Description	Q'ty
© - 101	PBAPX14B52	Panel PCB Ass'y (RTL) Δ	1, [a]
R301 , 302	ERDS2TJ271	Resistor 270	2
C300	RPE132F104	Capacitor 0.1 μ F	1
D300	LN220RP	LED (RED)	1
D301	LN320GP	LED (GREEN)	1
SW300 , 301	EVQ-21405R	Switch	2
CN16	PBJE9Y52	Connector with Cable Panel Δ	1, [a]
Ⓐ - 101	PBAPX15B52	Sensor PCB Ass'y (RTL) Δ	1, [a]
R400	ERDS2TJ151	Resistor 150	1
R403	ERDS2TJ472	Resistor 4.7k	1
R402	ERDS2TJ473	Resistor 47k	1
R401	ERDS2TJ563	Resistor 56k	1
C400	ECEA0JKA101	Capacitor 100 μ F	1
C401	RPE132F104	Capacitor 0.1 μ F	1
Q400	2SC1740S	Transistor	1
IC400	0N2173-R	IC (Photo Sensor)	1
CN16	B3B-XH	Connector with Cable Sensor Δ	1

6. Main Board

Ref. No.	Part No.	Description	Q'ty
© - 100	PBAPX16B52M	Power Supply PCB Ass'y (RTL) (KX-B520, C, T) Δ	1, [a]
© - 100	PBAPX37B52G	Power Supply PCB Ass'y (RTL) (KX-B520A, G, H, S, U) (KX-B620A, G, H, U) Δ	1, [a]
R3	MPC75005	Resistor 0.05	1
R2	ERD25TJ100	Resistor 10	1
R6	ERD25TJ102	Resistor 1k	1
R8	ERF5TJ100	Resistor 10	1
R4 , 5	ERD25TJ103	Resistor 10k	2
R7	ERD25TJ472	Resistor 4.7k	1
R9	ERD25TJ470	Resistor 47	1
R10 , 11	ERG2SJ152	Resistor 1.5k	2
R1	ERU5TAJ150	Resistor 15 Δ	1
C13	ECOS1JG472	Capacitor 4700 μ F	1
C17	ECEA1VU102	Capacitor 1000 μ F	1
C14	ECEA1HGE010	Capacitor 1 μ F	1
C4	ECEA1VGE332	Capacitor 3300 μ F	1
C5	ECEA1VGE471	Capacitor 470 μ F	1
C6 , 7	ECEA1CGE471	Capacitor 470 μ F	2

Ref. No.	Part No.	Description	Q'ty
C11	ECEA0JGE221	Capacitor 220 μ F	1
C10	ECEA1CGE101	Capacitor 100 μ F	1
C1 , 2	ECKDRS221ME	Capacitor 220pF (KX-B520, C, T) Δ (KX-B620, C, T)	2
C1 , 2	ECKDRS222ME	Capacitor 2200pF (KX-B520A, G, H, S, U) Δ (KX-B620A, G, H, U)	2
C15	ECQP1102JZ	Capacitor 1000pF	1
C8 , 9	ECFW1H104ZF	Capacitor 0.1 μ F	3
C23	ECQF4154J	Capacitor 0.15 μ F	1
C19	ECQV1H474	Capacitor 0.47 μ F	1
C20 , 21	ECQB1H472	Capacitor 4700pF	2
C22	ECQE1104	Capacitor 0.1 μ F	1
C24	ECQU2A154M	Capacitor 0.15 μ F (KX-B520, C, T) (KX-B620, C, T)	1, [a]
C24	ECQU2A224M	Capacitor 0.22 μ F (KX-B520A, G, H, S, U) (KX-B620A, G, H, U)	1, [a]
C3	ECQU2A104M	Capacitor 0.1 μ F Δ	1
C16 , 18	RPE132F104	Capacitor 0.1 μ F	2
IC3	STK733C	IC	1
IC4	NJM79M12FA	IC (Regulator)	1
IC2	NJM78MP5F	IC (Regulator)	1
IC1	NJM78M12	IC (Regulator)	1
Q1 , 2	2SD1274C	Transistor	2
Q3	2SA673AC	Transistor	1
Q4	2SB1389	Transistor	1
D1 , 2	DSL10B-KC8	Diode	2
D3	RBV601	Diode	1, [a]
ZD1	GZB27C	Diode (Zener)	1
ZD2	MA1130MTA	Diode (Zener)	1
ZD3	RM26V1	Diode (Zener)	1
L1	FK060E1020	Coil Δ	1
L2 , 3	SK12M5Y	Coil	2
L4	SK21BS060X	Coil	1
T1	PBLT6H1ZA	Transformer	1
F1	PBXB239002Z4	Fuse 250V 2A (KX-B520, C, T) Δ (KX-B620, C, T)	1
F1	PBXB215001Z4	Fuse 250V 1A (KX-B520A, G, H, S, U) Δ (KX-B620A, G, H, U)	1
F2	PBXB235005Z4	Fuse 125V 5A (KX-B520, C, T) Δ (KX-B620, C, T)	1
F2	PBXB217005Z4	Fuse 250V 5A (KX-B520A, G, H, S, U) Δ (KX-B620A, G, H, U)	1
F3	PBXB235002Z4	Fuse 250V 2A (KX-B520, C, T) Δ (KX-B620, C, T)	1
F3	PBXB217002Z4	Fuse 250V 2A (KX-B520A, G, H, S, U) Δ (KX-B620A, G, H, U)	1

Ref. No.	Part No.	Description	Q'ty
ZNR1	C10DK271U	Varistor (KX-B520, C, T) Δ (KX-B620, C, T)	1
ZNR1	C10DK431U	Varistor (KX-B520A, G, H, S, U) Δ (KX-B620A, G, H, U)	1
①	PBAGA0001ZA	Heatsink A (IC)	1, a
②	TJC6320	Fuse Holder Δ	6, a
	PBMY4Z52	Heatsink (D3)	1
FG	PBJE27Z40	Cable FG Δ	1
CN1	B2P3S-VH	Connector Δ	1, a
CN2	B2P3-VH	Connector Δ	1
CN3	B4P-VH	Connector Δ	1
CN4	PBJE7YA	Connector with Cable Δ	1, a
CN5	PBJE5YA	Cable Δ	1, a
	TKK179484	Ground Terminal	1

7. Cable

Ref. No.	Part No.	Description	Q'ty
Ⓐ - 110	PBJE17Z52	Core with Terminal	1
Ⓑ - 110	PBJEA0165Z	Cable (CCD Sensor) Δ (KX-B620 Series)	1
Ⓑ - 110	PBJE6Y52	Cable (CCD Sensor) Δ (KX-B520 Series)	1, a
Ⓐ - 111	PBJEA0164Z	Cable (Home Position Sensor) Δ (KX-B620 Series)	1
Ⓐ - 111	PBJE10Y52	Cable (Home Position Sensor) Δ (KX-B520 Series)	1, a
Ⓑ - 112	PBJEA0163Z	Cable (Fluorescent Lamp Socket) Δ (KX-B620 Series)	1
Ⓑ - 112	PBJE12Y52	Cable (Fluorescent Lamp Socket) Δ (KX-B520 Series)	1
Ⓑ - 120	FL35SS-D	Fluorescent Lamp Δ	1
Ⓒ - 110	PBJE1Y52	Cable (CN6-CCD Sensor Cable) Δ	1, a
Ⓒ - 111	PBJE2Y52	Cable (Printer Head Power) Δ	1
Ⓒ - 113	PBJE4Y52	Cable (Printer Head Signal) Δ	1
Ⓒ - 115	PBJE11Z52	Cable (Paper End Sensor) Δ	1
Ⓒ - 116	PBWA1Y52	Power Supply Cord Ass'y Δ (For U. S. A.)	1, a
Ⓒ - 117	PBWA2Y52	Power Supply Cord Ass'y Δ (For Germany)	1, a
Ⓒ - 118	PBWA5X52	Power Supply Cord Ass'y Δ (For Hong Kong)	1, a
Ⓒ - 119	PBWA4Y52	Power Supply Cord Ass'y Δ (For England)	1, a
Ⓒ - 120	PBWA6Y52	Power Supply Cord Ass'y Δ (For Australia, New Zealand)	1, a
Ⓒ - 121	PBWA7Y52	Power Supply Cord Ass'y Δ (For Switzerland)	1, a

8. Packing Parts

Ref. No.	Part No.	Description	Q'ty
	PBPGA0085Z	Carton (KX-B620 Series)	1
	PBPGA0009Z	Carton (KX-B520/A/C/H/S/T/U)	1
	PBPGA0010Z	Carton (KX-B520G)	1
	PBPGA0084Z	Bottom Carton (KX-B620 Series)	1
	PBPGA0007Z	Bottom Carton (KX-B520 Series)	1
	HP-460WS	Speed Clip (KX-B620 Series)	6
	HP-601W	Speed Clip (KX-B520 Series)	6
	PBPQA0038Z	Cushion (upper left) (KX-B620 Series)	1
	PBPQA0004Z	Cushion (upper left) (KX-B520 Series)	1
	PBPQA0040Z	Cushion (upper center) (KX-B620 Series)	1
	PBPQA0006Z	Cushion (upper center) (KX-B520 Series)	1
	PBPQA0039Z	Cushion (upper right) (KX-B620 Series)	1
	PBPQA0003Z	Cushion (upper right) (KX-B520 Series)	1
	PBPQA0036Z	Cushion (lower left) (KX-B620 Series)	1
	PBPQA0002Z	Cushion (lower left) (KX-B520 Series)	1
	PBPQA0037Z	Cushion (lower right) (KX-B620 Series)	1
	PBPQA0001Z	Cushion (lower right) (KX-B520 Series)	1
	PBPPA0007Z	Cover for the unit (KX-B620 Series)	1
	XZB98X126A4	Cover for the unit (KX-B520 Series)	1
	PBPQA0005Z	Cushion for the unit	2
	XZB13X30A04	Poly Bag for Cushion	3
	XZB42X90A04	Poly Bag for Printer	1
	ZKS3XB5200Z	Cushion Bag for Accessories	1
	PBPEA0008Z	Frame Cover Cushion Sheet (KX-B620 Series only)	3
	XZB25X40A40	Poly Bag	1
	WZ0XB50EAC0	Eraser	1
	MQ0XB55EAC0	Marker Set	1
	PBHP5Z	Copy Paper	1
	PBQX50060Z	Operation Manual (U.S.A. version)	1
	PBQX50061Z	Operation Manual (other version)	1
	PBQX50062Z	Installation Manual	1
	PBQX4Z	Note for Fastener Attachment (U.S.A. version only)	1